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ORIGINAL ARTICLES

EFFECTIVE USE OF AUTOPSY IN MEDICAL EDUCATION 303
A. A. Angrist, M.D., New York

THE MEDICAL SOCIAL CASEWORKER IN "PRIVATE" MEDICAL PRACTICE 309
H. M. Margolis, M.D., and Harold Mendelsohn, M.S.W., Pittsburgh

RECENT SOCIOLOGIC TRENDS IN MEDICAL PRACTICE 313
W. A. Sawyer, M.D., Rochester, N. Y.

THE SOCIAL WORKER AS A TEACHER IN MEDICINE 318
W. W. Schottstaedt, M.D., and M. E. Gwinn, M.S., Oklahoma City

STANDARD NOMENCLATURE CODING OF PATHOLOGICAL DIAGNOSIS 321
A. S. Conston, M.D., Camden, N. J.

ALIEN INTERNS AND RESIDENTS IN THE UNITED STATES, 1955-1956 322
J. E. McCormack, M.D., and Arthur Feraru, D. en D. de L.U. (Lyons), New York

CLINICAL NOTES

MAXIMUM BENEFIT FROM THROMBOENDARTERECTOMY 324
C. A. Kruse, M.D., and F. G. Kirby, M.D., Santa Monica, Calif.

BROWN-SÉQUARD SYNDROME WITH BILATERAL ELEPHANTIASIS IN NEUROFIBROMATOSIS 326
L. H. Hudson, M.D., and T. R. Cox, M.D., Little Rock, Ark.

SPECIAL ARTICLE

THE SIX UNITIES IN MEDICAL RESEARCH 328
E. C. Albritton, M.D., Washington, D. C.

SPECIAL REPORTS

Council on Pharmacy and Chemistry

CURRENT STATUS OF THE DRUG THERAPY OF EPILEPTIC SEIZURES 333
M. D. Yahr, M.D., and H. H. Merritt, M.D., New York

MEDICAL LICENSURE STATISTICS FOR 1955

State Boards of Medical Examiners 340

Board of Examiners in the Basic Sciences 374

National Board of Medical Examiners 376

EDITORIALS

The New A. M. A. Directory 379

The Fifty-Fourth Annual Report on Medical Licensure 380

A Guide to the Essentials of a Modern Medical Practice Act 381

Changing Character of Medical Meetings 381

THE PRESIDENT'S PAGE

A Monthly Message 382

ORGANIZATION SECTION

Actions by Board of Trustees 383

Federal Medical Legislation 384

Seattle Clinical Meeting 384

REGULAR DEPARTMENTS

Medical News 385

Correction 388

Examinations and Licensure 388

Deaths 389

Foreign Letters:

Argentina: Epidemic of Poliomyelitis 390

France: Hemobilia. BCG Vaccination 390

India: Effect of Anticoagulants on the Sedimentation Rate. Surgical Treatment of Leukoderma. Leprosy. Adrenal Cortical Function in Diabetes 390

Japan: Tuberculosis. Socialized Medicine 390

Peru: Symposium on Sinusitis. Poliomyelitis. Arnold's Neuralgia. Identification of the Newborn Infant. Estrogens and Mammary Function 391

United Kingdom: Antigenicity of Poliomyelitis Vaccine 391

Correspondence:

Reinoculations of Poliomyelitis Vaccine. Two Deaths in Long-Distance Runners 392

Medical Literature Abstracts 393

Book Reviews 396

Queries and Minor Notes:

Sudden Death During Coronary Attack. Cadmium Toxicity. Third Injection of Salk Vaccine. Periodic Ulcerations of Labia. Biological False-Positive Reaction. Removal of Nevus. Pains in Pregnant Woman's Arms. Tonsillectomy. Hospital Records 397

WASHINGTON NEWS

The Social Security Bill. Medical Topics in Congress. Report on Veterans' Benefits. WHO Reactivates Russian Participation. Miscellany ..... Adv. Page 13

From Other Pages ..... Adv. Page 24

National Organizations of Medical Interest ..... Adv. Page 26

Meetings ..... Adv. Page 56

Magazine-Television Report ..... Adv. Page 60

Tonics and Sedatives ..... Adv. Page 70

The Bright Side ..... Adv. Page 98

Books Received ..... Adv. Page 116

Index to Advertisers ..... Adv. Page 124

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Specimen Page

Causes of Unresponsiveness to Diuretics. SODIUM COMPOUNDS. For several reasons, heart failure may persist with no recognized change in the heart or associated infection despite adequate amounts and proper administration of diuretics. These effects may be due to the taking of sodium-containing compounds and sedatives. The chief offenders are ordinary salt and antacids. Occasionally sodium bicarbonate (baking soda), sodium salicylate, rhubarb and soda, sodium bromide, food preservatives such as caffeine sodium benzoate and soft drinks containing sodium also interfere with diuresis. Saline laxatives and sedatives containing sodium bromide are particularly important in this connection. The taking of sodium surreptitiously or inadvertently is worth looking into when, with no apparent change in the patient's cardiac functional capacity and for no other apparent reason, diuresis suddenly fails. [See reference 156.]

ANTIDIURETIC COMPOUNDS, SEDATIVES, ANTIPYRETICS AND NICOTINE. In the majority of humans and in experimental animals, opium and its derivatives may be shown to exert an antidiuretic action for both salt and water. This action is similar to that of the pituitary antidiuretic hormone, and may indeed be due to a release of this hormone. The antidiuretic effect starts 20 to 30 minutes after an injection of a narcotic and may last over an hour. Narcotics should therefore be omitted when diuretics are given unless the patient's condition requires the narcotic. In the exceptional case of a patient with severe and intense anxiety it is possible that the relief of anxiety induced by a narcotic may enhance diuresis from mercury. As a rule when narcotics are in use, a diuretic should be withheld for at least 3 to 4 hours, and following a mercurial, 6 to 8 hours should elapse before a narcotic is given. Nicotine may also inhibit diuresis by stimulating ADH release into the blood stream. Barbiturates, quinine, antipyrine, aminopyrine, acetanilid, acetphenetidin, and butazolidine inhibit diuresis. These drugs become a factor in diuresis when they are administered in large amounts or over long periods. [See references 16, 27, 28, 42, 127, 132, 139, and 145.]

Effects of Steroids on Congestive Failure

It is well known that in heart failure cortisone and ACTH cause retention of sodium and water. This is less so with prednisone. Estrogens and testosterone also cause water retention. The action is likely due to an increased reabsorption of sodium and water from the tubules, but the mechanism remains to be clarified. Interestingly, Gaunt and his associates developed evidence that indicates an antagonism between the corticosteroids and ADH. From clinical experience this view does not seem to be borne out, except for the observations of Camara and Schemm, who found that in resistant failure the corticoids had an opposite effect to the one anticipated. They treated three types of patients: (1) those resistant to the usual diuretic regimen; (2) those who had hypertension with severe pulmonary congestion and paroxysmal dyspnea that recurred despite digitalis and mercurials; and (3) patients with advanced cor pulmonale. [See references 21 and 55.]

They administered 10 to 25 mg. of corticotropin every 6 hours for 10 to 12 days. A few received 5 to 15 units three times a day. A spontaneous diuresis began in some of this group on the fourth to the sixth day. In 4 the diuresis continued after the corticotropin was stopped. In 3 others the diuresis began after the therapy was stopped. Ten patients who had been resistant to mercurial diuretics before the steroid was given became responsive again. Only 4 did not respond at all.

This observation on the effect of corticotropin on congestive failure is important but difficult to explain and has not been confirmed. One possible explanation is that the improved clinical condition is due to the non-specific improvement in mental state and in appetite. The better intake of food may relieve nutritional deficiencies

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EFFECTIVE USE OF AUTOPSY IN MEDICAL EDUCATION

ITS ROLE IN CORRELATION AND INTEGRATION

Alfred A. Angrist, M.D., New York

• *The autopsy can be a crucial point of departure for the integration of knowledge in the clinical fields and the basic sciences. Contact with the autopsy can come early in medical education and can remain effective throughout the career of the student and the physician.*

The autopsy can do more than just test the accuracy of diagnoses and the effectiveness of treatment in its modern setting of meticulous study by all basic science techniques, with appropriate dynamic interpretation of sequential pathogenesis. Thus, the autopsy becomes the grand human experiment available to all departments for application of their fields of study. It can correlate teaching and research without complex changes in the curriculum, without administrative difficulties, without additional cost, and without interfering with other simultaneous experiments in medical education.

The autopsy should be restored to its historic place in medical education as an invaluable source for program, conference, and research and teaching material, making the autopsy service a unifying force in the medical school.

There is a need for an appropriate orientation and true perspective in medical education, with a definition of the specific aims and objectives of the over-all teaching effort. The viewpoint of medical educators has been given explicitly.[1] An ever-increasing number would have the stimulus to productive scientific investigation, the primary if not the sole, criterion for the evaluation of teachers and teaching. Obviously, then, the goal must include the development of good physicians oriented to the maintenance of health and the care of the whole patient.

Recently, more effective teaching has been sought by the promotion of better correlation and integration of the separate specialties and several basic sciences in the presentations to the student. To achieve this goal, many medical schools are now experimenting with new and often extensive rearrangement of individual courses and of the curriculum,[2] particularly that of the first two years. Other colleges have used special devices, such as bringing the clinical subjects into the freshman year in the form of demonstrations and special sessions, or the assignment of hours for clinical application of the basic sciences, and even combining related courses of study and teaching them as one, such as physiology and biochemistry. The numerous attempts in this direction vary quite markedly.

The stimulating teacher with a fund of related knowledge can do much individually. A program to improve the pedagogy in medical schools is distinctly in order, with a fuller use of audiovisual aids and all other efficient means of communication. It is my contention that the integration of the basic sciences and clinical specialties and their correlation with clinical medicine, oriented to the patient as a whole, can be achieved readily and simply by the fuller use of the autopsy in a modern setting. The renaissance that would follow for the autopsy would help meet the primary objectives in medical education effectively and economically by promoting assimilation, synthesis, and application.

The present tendency in all scientific work, and in medicine particularly, is toward the laboratory aspects and the experimental methods. I do not wish to belittle the importance of the laboratory aspect of medical training. It is only natural that the investigator in basic science finds the complex patient an uncontrolled experiment and understandably prefers the delimited method of parallel animal controls with one variable only. Such an approach results necessarily in a progressive narrowing of specific fields of endeavor and opposes the forces making for broadening integration and correlation. This subdividing and narrowing of interest is often essential for research, but does not simplify the task of effecting a unified concept in teaching, that is, a teaching program for the practicing physicians as well as the research scientists.

A program for integration and correlation in medical education should be a two-way proposition. The laboratory can accomplish a degree of integration by bringing the broad general principles and the applicable factual knowledge of the basic sciences into the clinical sphere. However, the rich experience gained by the care-

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ful observation and disciplined deduction in the clinical study of the patient and by means of the autopsy should also be brought to the basic sciences. In this way the methods and results of the research scientist can be made to contribute to the education of the medical practitioner and the observations derived through medical practice can become an informative and creative stimulus for scientific research.

Place of the Autopsy in Medical Education

I should like to call attention to an adaptable old instrument for promoting correlation and integration, a medium that has not been used fully for this particular purpose and is now actually being neglected unduly in many teaching institutions and hospitals. I refer to the opportunity afforded to reach this goal of dovetailing the modern advances in the basic sciences and the clinical fields at the very crossroads where they all must meet, namely, that focal point of demonstrable factual data, the autopsy. This is accomplished by the efficient use of the old "organ recital" supplemented by rapid follow-up completion of studies, all presented in routine conferences. This method of integration and correlation of all the individual subjects of the curriculum can be applied forthwith in any medical college, whether an accompanying parallel curricular change, partial or complete, is attempted simultaneously or not. It is adaptable at the undergraduate and postgraduate levels and in every college and hospital. The autopsy can be a crucial point of departure for the integration of knowledge in the clinical fields and basic sciences, with the greatest carry-over value to medical practice and the care of the patient. Contact with the autopsy can come early in medical education and can remain effective throughout the career of the student and the physician.

In the appraisal of the value of the autopsy in modern medical education at the teaching institute at French Lick, Ind., in 1955, a parallel was drawn with that of the lecture. It was generally agreed that formal lectures still had a place in medical education. So, too, does the autopsy. This does not imply that either the lecture system alone or the autopsy exclusively is properly the only important instrument of medical education and should be stressed unduly as an isolated discipline. The autopsy has made and, in symbiosis with other disciplines, can continue to make an indispensable contribution to medical teaching.

The superiority of the American medical school can be attributed largely to the use of both laboratory and bedside teaching. The definitive check in bedside teaching is the autopsy. Without application to the patient in bed or to the body on the dissecting table, all unifying efforts in the teaching field can easily be ineffective. Also, without the autopsy, many of the finer fundamental phases of basic sciences remain abstract and their teaching value is much reduced. Attempts at correlation, which are made theoretically and in a vacuum without reference to the individual patient, remain vague and intangible and are inevitably unsuccessful, whether they are instituted by the faculty voluntarily or superimposed by administrative manipulation or fiat. The use of the autopsy for achieving correlation is nothing new; it may seem a reversion to an earlier method of teaching. If so, the fuller use of the autopsy can exploit the advantages of the old in a modern setting.

Modern Concept of the Autopsy

The beginnings of modern medicine found their expression in the autopsy. The history of medicine shows the autopsy in a keystone position, and there I trust it will remain always. In the past the autopsy was conceived of as morbid anatomy only, for establishing the cause of death and labeling the disease. The modern concept of the autopsy is that of an investigative and teaching instrument that goes beyond morbid anatomy in the traditional sense of mere diagnostic gross and microscopic study. The scientific autopsy is oriented to a realistic reconstruction of the process of disease as it occurred in the patient while alive. It presents the dynamic picture of origin and course of the disease as altered by all interrelated factors, both intrinsic and extrinsic, operating in a particular host. The present teaching opportunities apply much more forcibly to the autopsy in its modern setting of histochemistry and functional interpretation,[3] conceived of dynamically and analyzed sequentially. The autopsy can give the whole known story of the disease process leading to death to as great an extent as is definable in the present condition of knowledge. The autopsy gives us the pathology, which so often means much more than the etiology alone. The same etiology can produce remarkably different pathological lesions, and the story of the patient correlates with the pathology oftener than with the etiology alone. This modern conception of the autopsy makes correlation and integration of our knowledge its routine function, with direct application of these principles all the while. Viewed in this manner, the autopsy becomes the grand human experiment, and, just because it is uncontrolled, its study requires broad universal knowledge and considerable analytical skill.

Medicine owes the autopsy much; yet a justification for its fuller use seems indicated from the attitude taken by several outstanding medical educators who were present at the teaching institute in French Lick. At this teaching institute, the autopsy was belittled by such phrases as "dead-house" study, "meat-reading," "knowledge smothered in Formalin," the mere "end-result," and "only the single and final frame in the whole motion picture." The autopsy is presented by some members of the faculty in some institutions as a time-consuming, "smelly, gory mess," and "likely to add little to our store of knowledge." The microscopic slide of the autopsy or the surgical specimen is also offered as a "still more limited single frame in the natural picture of the disease," as a "mere caricature of the true histological picture," "unnatural and distorted," and again, "capable of adding little to our understanding of the dynamic disease process."

To many, the autopsy offers merely a static opinion, in the form of "final anatomic, pathological diagnosis," and thus has been degraded to "a labeling process" or "name-calling." For such, pathology has been divorced from true understanding of disease and reduced to nomenclature, i. e., "internal dermatology," in the sense

of descriptive dermatology of olden days. Although it is true that there can be nothing so gross as the gross autopsy, yet it is oftenest at the autopsy table that demonstrable fact begins to replace the hypothesis and theory in clinical medicine. Case analysis is stabilized at the dissection table by the demonstration and interpretation of all data acquired. Here applicable information is delimited and properly related. Here we can apply concretely all of the knowledge of all fields, including the advances of basic science; establish etiology; and venture into pathogenesis and attempt to determine the true sequences of events in the particular instance at hand.

The complex setting and the medicolegal implications of the autopsy often require considerable skill and a great deal of experience. Such skill and experience are not acquired easily or quickly. Maturity in this field comes only with persevering, patient, and painstaking effort. It is this grim demand that may well account for the present lack of enthusiasm for autopsy pathology. The failure of the autopsy service to yield quick, easy, and immediate rewards in the form of grants, publications, and promotions, in contrast with the situation that prevails in controlled experimental research, may account in no small measure for the lack of interest in and support of the autopsy in many of the medical colleges. Many who are most critical have not been exposed to the autopsy technique in its modern setting at all. Yet if the knowledge of disease and the transmission of "the art of the use of such knowledge" are to be the goal in medical education,[2n] then the autopsy will continue to be of major service in teaching and continue to make contributions in the future.

Autopsy as a Means of Integration and Correlation

Pathology is not a fundamental, basic science in the sense that physics and chemistry are. Yet clinical medicine is still further removed from this goal of ultimate understanding. It should be noted that physics and chemistry, too, will ultimately be written in terms of pure mathematics applied to the nucleus of the atom with its included smaller particles and the satellite electrons of the molecule. In a sense, biochemistry, microbiology, pharmacology, and physiology represent useful compromises with the "pure and fundamental" theory, necessary for understanding, in the present imperfect state of knowledge. Pathology represents a similar compromise at a lower level of the fundamental, yet it is justified fully by its more direct, ready application to medicine, whose plane of understanding is, as noted, at a still lower level of the fundamental and the absolute.

Pathology is a bastard offspring, born when the "parents," modern basic sciences, were unknown. It is an admixture of genes from all of them. Yet, it is this very impure background that is its source of strength as an instrument of integration and correlation. It is often necessarily descriptive only, and, oftener than not, it gives no numerical data easily subject to statistical analysis. It acquired a legitimate status only on the basis of pragmatic necessity in medical education.

The autopsy is a crass and crude investigative instrument compared to the flame photometer, the infrared or mass spectrometer, or the electron microscope. Its concepts are quite unrefined when compared to electron shifts and enzyme thermodynamies. Its usefulness still depends upon interpretative skill, and its technique in this respect approaches an art in its dependence on the intuitive and its lack of mathematic quantitation. Its range of error is much wider, to be sure. Yet, the autopsy offers the perfect setting for the pragmatic application of basic knowledge and helps materially by the orientation it affords to the practitioner of medicine. Without the autopsy as a means of discipline and control, the basic scientific knowledge, no matter how profound, can often be applied in medicine by post hoc association only.

The contribution of the basic sciences to the remarkable recent advances in medicine is obvious. Yet, it is from the mutable, variable interaction of all factors in the host as a whole, as seen at the autopsy, that the fullest measure of understanding of disease in the human can be elicited. The facts of basic science can be applied only superficially, if isolated from a comprehensive understanding of the whole disease process in the host as a whole. Good medical practice with accurate diagnosis and good clinical therapy require far broader, more complete comprehension than that of etiology alone. If the basic science contribution is applied as an isolated discipline in the interpretation of disease, the correlation can be only partial. Such contributions in basic science, if treated alone, without regard to the many other factors that enter into the complex picture of illness and pathology, must be one-sided and often lopsided. The changes wrought in each host vary, and a knowledge and understanding of these changes is essential for the larger appreciation of the full range of reaction of the disease process and its conceptual evaluation and clarification.

The application of the best scientific factual knowledge can be quite unscientific indeed, and on occasion may be only one step removed from quackery. One need hardly be a qualified, trained physician to administer a potent antimicrobial agent to a child with epidemic cerebrospinal (meningococcic) meningitis or to an adult with tuberculosis. It is the understanding of the etiology and the pathology, including the step-like stages in the pathogenesis and the complications, that makes the application of the basic science knowledge truly scientific from the medical standpoint.

The pathology of disease represents a resultant vector of many lines of force. Though the postmortem examination must be the final frame in the motion picture of disease, it is the key to the significance of all preceding frames. The full analysis of the autopsy offers the opportunity to project backward to the beginning of the story, and then to what follows subsequently and consecutively, to obtain a better understanding of the interactions and the step-like sequence of events. The completed story (complete within our own limited knowledge of the truly basic pathogenetic mechanisms) can often be reconstituted from the autopsy findings and sometimes only from these findings. The autopsy can be the means for concrete orientation of the abstract and the theoretical, as well as pragmatic, experience for integrated teaching. In this light the autopsy very naturally "makes for 'horizontal' and 'vertical,' 'backward' and 'forward' correlation."

The analysis of the autopsy, to the extent that it attempts to be complete, compels integration and correlation. It does not do this theoretically and artificially,

either, but in an applied, tangible manner in the natural setting where it is most effective. As noted, the modern autopsy does more than demonstrate the pathological lesions, determine their etiology, and establish the cause of death. Every effort is directed to determine the age of each individual lesion and its relationship to others in time as well as to causation and pathogenesis. The demonstration of a coronary thrombus is not the end but only the beginning of an autopsy study. Which portion of the thrombus is oldest? What parts represent recent propagation? If all of it is not of the same age, has there been distal or proximal propagation? Why did the thrombus form, and why did it form in a particular place? Are there changes in the vessel wall locally? Are the local vascular changes primary or secondary to changes in the thrombus proper? What changes in the myocardium correspond accordingly? What particular events in the clinical course are to be correlated with what thrombus or portion thereof and with the demonstrable alterations in the myocardium that correspond in time and location? These are a few of the questions, the answers to which should be sought as diligently as possible in an autopsy. It is the timing of processes in the autopsy that often makes for the most interesting correlation.

Specific Procedure for Use of the Autopsy for Integration and Correlation

The machinery for the use of the autopsy for integration and correlation in this fashion can vary, but it can be simple indeed. All objectives can be met by a versatile teacher in the department of pathology; yet they can be accomplished best with the full cooperation of all departments. This means attendance of all departments, by representatives or en masse, at the gross and microscopic review conferences described below. The presence throughout the conference of representatives from the x-ray department and from other diagnostic and clinical departments is very desirable, if not essential. The specific procedure to be presented here expands the usual gross and microscopic autopsy reviews to achieve an organized, expedited, continuing, analytical routine conference presentation of the entire autopsy experience of the institution, accelerating the process of study and the completion of the analysis and maintaining interest thereby. The autopsy service then becomes an emergency service for teaching and learning, i. e., communication in the modern technical sense. It makes all the correlation studies and the compilation of material for each and every department in the institution a simple and continuing process.

Every autopsy is not used in the form of the usual clinical-pathological conference, i. e., the Cabot cases. There is a distinct place for such Cabot presentations with their stress on detailed history, physical and laboratory findings, and a thorough, meticulous clinical analysis with the completed studies and final presentation and demonstration of the pathological findings. In this latter form, the conference can cover little ground in an active autopsy service. Covering one or two cases at most, it necessarily becomes rather an inefficient approach to undergraduate education. This form of exercise is also often reduced to a diagnostic game of limited value. In undergraduate teaching, the ordinary clinical-pathological conference can become very time-consuming as an instrument of integration and correlation.

All of the autopsies of each week are used for autopsy conferences designed for teaching purposes. The present routine has evolved quite naturally from a small beginning as the customary familiar weekly "organ recital." The spontaneous, progressive growth of this routine speaks well for its inherent value. Unlike the Cabot presentations, a very concise synopsis of the history and clinical findings is given and the nature of the problem outlined. This is limited to a few minutes. The department of roentgenology presents the pertinent films. Only relevant findings are given. The final clinical diagnosis is read. Nearly all the autopsies of the week are disposed of rather quickly at the very first gross conference; some are left unresolved to be reviewed the following week after completion of the microscopic and all additional studies; and some are never solved completely after several recurrent weekly efforts.

Representative portions of all the organs are saved and presented by the resident. The exact clinical opinions expressed are noted, and the pathological diagnoses of the pathologists and others present are recorded with a listing of all differences in opinions. The problems in diagnosis, pathogenesis, and clinical correlation to be resolved and crystallized by further study are itemized. This is all done before the microscopic study is completed.

The microscopic sections are completed and studied by Saturday of the same week. On this day the gross photographs and all pertinent slides of each and every case are projected and discussed. It is imperative that this time interval between the gross and the microscopic presentation be kept at a minimum. The advantages of such early microscopic follow-up are obvious. It helps correlate gross and microscopic pathology and tends to bridge the visual gap between the two. By this means, also, all problems are kept alive and the entire institution is kept on the alert. Each specialty is mindful of the contributions its own field can make in the final analysis. An air of immediacy prevails in relation to the autopsy service, and the department of pathology benefits as a result. Reading of the literature before and after the separate gross and microscopic presentations becomes compelling for faculty and students. The entire problem of each case, including all the pertinent aspects requiring clarification, remains fresh in everyone's mind. Further necessary studies are outlined at this "microprojection conference" while the problem is still crystallized and all material is still at hand, with the benefit of immediate consultation between the many services and disciplines, including the basic sciences. By keeping all gross specimens on ice until after these conferences, the danger of discarding material prematurely is avoided.

The analysis of the case presentation includes all studies possible in all fields, such as bacteriology, toxicology, biochemistry, pharmacology, histochemistry, and other specialties. The time sequence of lesions in particular is noted for correlation with the clinical story. It is amazing how interesting a simple case of pulmonary embolism can become when the exact time factors are considered,

such as the age of the actual thrombus in its original site and as an embolus, in relation to the clinical symptoms, the secondary tissue changes, the electrocardiographic findings, and the mechanism of death.

At the very beginning of the next weekly conference on Monday afternoon, all corrections of the "gross opinions" of the previous week, on the basis of the microscopic and other studies, are noted for the assembled group. The Monday afternoon conference starts on time with a good attendance to hear this "confessional." To be effective, this entire scheme requires a readiness on the part of the pathology department to commit themselves and to make and admit errors. A very wholesome competitive air is introduced, which adds zest and interest. The man who makes the correct diagnosis is asked why and wherefore. The reverential bow is given to the good reason and not just to the right diagnosis. This introduces an important ancillary benefit, for one is required to put into words the analysis of the case. Training in self-expression, in articulate analysis, and in thinking on one's feet is an important incidental gain.

In this fashion, the art of interpretation of gross pathology in its application to clinical medicine is fostered, the gap between the gross and microscopic is narrowed, and the acquisition of a "tissue sense," that intangible "feel" for tissue, is promoted. Above all, however, correlation and integration, both "horizontal" and "vertical," of all the basic sciences, in the explanation of the clinical picture and the pathological lesions occur quite spontaneously. The autopsy becomes an immediate and continuous instrument of teaching, learning, and training.

Use of the Autopsy in Project Teaching

The outstanding feature of the autopsy review conference procedure is the participation of all who attend the conferences in the step-wise, progressive, and continuing analysis and correlation of all the cases, as the study is progressing. A further benefit of limited project teaching can also be obtained by simply assigning one or more students to assist with the autopsy and to assume a measure of responsibility for the completion of the study. This is being done in many medical schools at present, with student participation and presentation of autopsy material.

The project method of teaching is applied oftenest now in the experimental laboratory. However, the value of this method for medical education can be much reduced if it is used exclusively and replaces the anatomic-pathological base unduly. Under such circumstances, this basic advance in education can become a harmful influence in medical training by narrowing the possible range of study in a sphere of learning that must be broad for human application. In order to be oriented properly and to be able to test his basic training in clinical experience, the student needs to master a wide range of basic knowledge, which, in the time allotted for medical education, cannot be acquired by the project alone, in either autopsy or experimental work.

In the application of the project method to the autopsy, the assigned student and pathology resident should make a meticulous preliminary study of the chart. A thorough discussion of the clinical aspect of the case with the clinical resident staff and attending physicians is then imperative. A check list should be compiled and placed on the blackboard before the autopsy is begun. This should include the full range of diagnoses considered clinically, the timing of the dramatic events in the course of the illness, the reactions to therapy, and all phenomena that could determine or affect observations at autopsy. The terminal events and detailed data of the final days of illness, which require explanation particularly, should be included for correlation in this check list.

Before the autopsy is begun, preparations for all contingencies suggested by this list should be made. This should include preparation for toxicologic, bacteriological, and virus studies, animal inoculations, special fixatives for histochemistry, biochemical determinations, and enzyme and hormone extraction studies. Other departments in the institution should be alerted and consulted as to recommendations for special preparations and samples desired and advisable procedures to be pursued. Containers, syringes, needles, aspiration bottles, special fixative, enzyme and antibiotic inhibitors, culture mediums, and containers for toxicologic studies should be at hand. A member of the resident staff should perform the autopsy, a student should be assigned to assist, and a senior member of the department of pathology should supervise and be available for consultation. Ample photographic records should be made, particularly of those findings that must be lost by subsequent dissection (such as fluid accumulations and shifts of viscera). Dissection should be performed with the objective of obtaining the facts and preserving the evidence for demonstration. Each case should be an *Arbeit* and should be approached with the idea of obtaining from it as much information as possible in the form of all the facts, the true sequence, the best method of demonstration, and the further confirmation of the propounded mechanisms. Special services in the institution should be consulted as the autopsy progresses and reveals questions and problematical material for interpretation. As the autopsy continues to completion, the entire check list should be covered.

The autopsy cannot be the equivalent of the controlled laboratory experiment. In this respect, the autopsy has the same limitations as clinical medicine. Yet, much can be gained by the teaching of careful analytical observation and appreciation of the limits of permissible deduction. The student can learn how to perform an autopsy, describe the findings, preserve the evidence, pursue the study, use consultations as needed, and formulate his interpretation. There is a pragmatic advantage here because any physician may be confronted with the necessity of performing an autopsy, as recent Army experience has shown. The benefits of this project treatment of the autopsy are significant, though merely coincidental and secondary compared to the educational value for all students and members of the faculty who participate in the progression of the case from the original crude gross presentation until its final and complete analysis.

General Benefits of the Comprehensive Use of the Autopsy

Assigned students, members of the entire student body, faculty with free time, and all members of the department of pathology have the benefit of seeing all of the autopsy material. The conferences provide a running review of general and systemic pathology, related to the clinical, the functional, and the fundamental. These review conferences also serve to establish uniformity of nomenclature and classification and help to group material automatically for study and publication. This routine serves to point out many unknown aspects of disease that require further study and elucidation by the clinician and the basic scientists. The autopsy no longer belongs to the department of pathology but to the institution as a whole. In this way, spontaneous contact and voluntary cooperation between separate departments is promoted, and both faculty and students become benefactors. Above all, there is a broad participation in the analysis and process of solution of the case as it evolves, and not merely as a *fait accompli.*

Probably the most important advantage in the procedure outlined is this active participation of the student body and faculty in the analysis of the case. All share and assist in the step-like sequence toward the solution of the problem, in the confirmation of the clinical evaluation, or in the delimitation of the insoluble aspects of the case. An appreciation of the effort entailed in a scientific autopsy analysis and an understanding of what can and cannot be expected of it is the result. The comparison with other cases seen in the past and cited from the literature makes each and every autopsy an educational experience of no mean proportion. On occasion the student indicates the correct approach, suggests where the basic sciences fit into the picture, and helps establish the pathogenesis and the correct diagnosis, missed by older, more mature pathologists. That type of individual thinking by the student is a worthy benefit, outlasting mere accumulation of facts; this constitutes good pedagogy. Above all, integration and correlation are inherent in the scientific autopsy analysis.

The rapid routine comprehensive presentation of autopsy material without delay can be done without adding or subtracting hours in the curriculum, without special lectures and careful detailed arrangements for combined effort presentations, and without new or special courses. Quite incidentally and yet very significantly, the use of the autopsy in this applied "bedside case presentation" format teaches the meaning of life and death in a civilized society and its public health aspects for the physician, gives actual training and experience in death certification and its medicolegal implications, and instructs in the fundamental legal principles of compensation and civil and criminal actions simply by including all such material for presentations at the routine conferences. In a similar fashion, the social, contagious, and preventive aspects of disease are demonstrated in a form where the application is immediate and dramatic. It is remarkable how often social aspects of the patient as a human being dealing with his work and his family and even his human frailties, his habit patterns and mental disturbances, and other intangible aspects, so important for the comprehensive understanding of the sick patient in modern society, crowd themselves into the several analytical autopsy conferences presented in this way.

In the evolutionary presentation of the autopsy material there is a distinct advantage that goes beyond that of simple integration and correlation. The demand upon the pathologists and the clinicians present at the several conferences to express their opinions explicitly for recording before the entire problem is solved unequivocably by microscopic sections and complete study is wholesome and makes the autopsy conferences effective as a teaching instrument of analysis. It removes the pathologist from that vaunted position of knowing all the answers and presuming perfection and wisdom. It makes for wholesome cross fire in discussion and study of each case and maintains sustained interest. Pathology loses its handicap (in both meanings of this ambivalent term) and is restored to a position of primary importance in medical education.

The autopsy is ideal audiovisual material and lends itself readily to visual demonstration and verbal discussion. It has a great potential for conference treatment and is ideal program material for medical educational television. It is the lack of adequate inexpensive program material that constitutes the great bottleneck in educational television today, and this has caused many such efforts to flounder. Closed-circuit television can bring the demonstration material from the mortuary and the surgical table to any department or conference room, small or large. Controlled open-circuit television, by means of scramblers and decoders, can bring this valuable educational experience to every undergraduate and graduate physician who has a television screen at his disposal. Knowledge is the physician's stock-in-trade, and he is ready and willing to pay for it. A stable base of income from a large group of interested contributors and regularly paying physician subscribers can thus be obtained for medical education. The autopsy then could make a very material contribution to the economic emancipation of medical education by thus becoming a source of income that is constant and earned. As an incidental feature, a stimulus for good teaching would be added, the recognition of this lost art would be tangible for all, teaching performance would improve, and good teaching might receive its due recognition and reward.

Summary and Conclusions

The autopsy is a focal point for the comprehensive integration and correlation of all knowledge applicable to medicine, particularly the basic sciences and the clinical specialties. The autopsy, properly performed and interpreted, orients this information to the patient as a whole just where it is of greatest value and interest to the physician. It helps to train the student in the art as well as the science of medicine. The adaptation of the pathology organ recital with expedited follow-up studies can be used to promote a more effective use of the routine autopsy in medical education. The autopsy, if presented in its modern setting, can be a potent instrument for correlative teaching and research.

The autopsy can help attain these desired objectives without additional time or complex changes in the cur-

riculum; without superimposed additional administration and committee meetings; without disruption of teaching schedules, routine service function, or departmental organization; without additional cost; and without any interference with other simultaneous experiments in medical education.

Autopsy material is ideal for demonstration and teaching at the graduate as well as the undergraduate level and is invaluable for program and conference material. It could be used advantageously to introduce television effectively into medical education, with potential general and financial benefits for the teaching faculty and the medical schools.

The autopsy service can be a unifying force in an institution and promote cooperation and cross fertilization between separate disciplines. The promotion of an autopsy service promises to arrest the growing tendency to relegate the autopsy to the status of a manual service chore, assigned to the lowliest member of the staff, and to restore this procedure to its historic position of importance in medical education.

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THE MEDICAL SOCIAL CASEWORKER IN "PRIVATE" MEDICAL PRACTICE

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• Environmental factors contribute to the etiology of disease, and the obviation of occupational or domestic causes of an ailment is sometimes an indispensable accompaniment to medication. This principle was illustrated in three cases, here described, in which a skilled social worker, acting as a member of an internist's staff, contributed substantially to the success of the diagnosis and treatment.

The complaints were musculoskeletal in all cases. Personal and family tensions were obvious. In one case the symptoms had begun 14 years before and had not been relieved by an operation for a cervical rib. In another the patient had been hospitalized for suspected poliomyelitis and had been at times unable to work.

Selected patients who have been helped by the social caseworker have regarded this assistance as proof of the physician's real interest in them. They have been impressed with the advantages of the practice of comprehensive medicine.

The impact of environmental and personal factors upon health is generally recognized today. In his office, the physician sees many cases in which these factors play recognizable roles by their influence upon the results of treatment and the recovery from illness. Since 1905, medical social casework has been part of the formal effort to ameliorate the disturbing influences of such factors in patients seen in hospitals and outpatient clinics. The applicability of the same principles of care to patients seen in the physician's office appears logical and is worthy of discussion.

It would be expedient, however, to review first the practices that have led to the development of the medical social caseworker as a potential addition to the internist's staff. Dr. Richard C. Cabot,[1] in his description of the shortcomings of his own practice, wrote as follows: "Facing my own failure day after day, seeing my diagnoses useless, not worth the time that I had spent in making them because I could not get the necessary treatment carried out, my work came to seem almost intolerable. I could not any longer face the patients when I had so little to give them. I felt like an impostor." Having become aware of such limitations in his practice, he was the moving spirit in the appointment of the first full-time paid social worker at the Massachusetts General Hospital.

Although the early concern of medical social work was almost exclusively with the indigent person, medical and otherwise, Dr. Cabot [2] wrote as early as 1919 that poverty should not be the criterion for the need for social work help. "The idea that social work necessarily concerns the poor is wholly wrong. It concerns the sick; it concerns the tuberculous; some of the sick and some of the tuberculous are poor. Others are not. . . . Thus the connection between medical and social studies is tending to upset the old idea that social work is necessarily concerned with poverty, and that economic studies are the main part of it."

Approximately 10 years later, Cabot [3] stated that, in addition to the physician, another professional person was necessary, one who would be primarily responsible for dealing with the social aspects of disease, "to study home conditions and report upon their part in causing or prolonging disease, and to help modify these conditions, financial, mental, moral, which stand between the patient and recovery. This 'someone' is the social worker —a man or woman trained to think of a human being as a whole."

With increased awareness of the links between various types of stress and disease, this field of inquiry has interested investigators in both the biological and the social sciences. Both the physician and the social worker [4] recognize that "in addition to infections and other in-

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jurious agents, the constitution and heredity of the patient, his personality, and the social and economic situation in which he lives all play an important part in the etiology, course, and prognosis of disease. Unless these factors as they involve each patient are taken into account, the therapeutic measures may be ineffectual and the prevention of disease virtually impossible." [4a]

Another physician and a sociologist,[5] viewing the person who is ill, point out that "an individual must be seen simultaneously as an organism, a member of society, and a personality in a culture. . . . Thus, as an organism man is borne along by his physical environment, but he is also buffeted about by some of its elements. As a member of society he is supported and reinforced by some fellow agents, while he may be frustrated, handicapped, or even vanquished by others. Similarly, as a personality he is both a product of his culture and a potential victim of its compelling or conflicting norms and codes."

To date, however, the formal evaluation and management of the social aspects of illness have applied primarily to the medically indigent. But despite the more stringent economic setup, the indigent have no monopoly on fear of disease or disability; worry about family adjustment; or dissatisfaction with themselves, their neighbors, or their work.

The problems of the private patient are substantially the same as those of the medically indigent. The same panic that may seize the laborer who fears the loss of his job may also seize the business man who fears the loss of his position because of illness. The frustration of a woman of wealth whose daughter wants to elope rather than finish college may be as intense as that of the woman in the hospital outpatient clinic whose daughter wants to marry rather than help support her family.

Since the medical social caseworker's usefulness is now recognized in hospitals and outpatient clinics, it would appear logical that the same skills might be useful if applied in the internist's office practice. Accordingly, the practice of having a social caseworker act as a member of an internist's staff has been in effect for approximately five years. It is interesting, therefore, to examine the manner in which this inclusion has functioned. The histories of three typical patients have been selected for presentation.

These three patients were seen in the physician's office by the caseworker, who was introduced as a member of the physician's staff. Emphasis was placed on the caseworker's special training and qualifications in dealing with the social stress factors that these patients were aware existed in their environment. All three of the patients were self-supporting; two were the heads of families. Two had long histories of illness for which previous treatment had been by varied physical modalities. All three patients presented complaints referable to the musculoskeletal system. Personal and family tensions also were obvious in all three patients, and the physician noted specific emotional factors for consideration in the initial examinations.

Since these patients were contending with inner stresses, the question of referral for psychiatric evaluation and therapy was considered. Since the patients were also contending with definite social stresses, however, it was felt that support of the patient's efforts to adjust to existing situations was, on the whole, and particularly at the outset, a more appropriate course than immediate referral for intensive intrapsychic therapy. The physician and the caseworker could not be primarily interested in changing the personality constellations of these patients who wished relief from physical pain. Nor were the patients prepared to seek a personality change; only so much of themselves as was in direct contact with their environment was amenable to change, and this was the area of practice of the medical social caseworker in the following three cases.

Report of Cases

CASE 1.—This patient was a 31-year-old white woman, single and a stenographer, whose complaint was of chronic muscular stiffness. These symptoms had followed an out-of-wedlock pregnancy at the age of 17 years. For the past two years there had been muscular tightness of the back and slight swelling of one finger. Other complaints included needle-like sensations in her head, generally hazy sensations, increased fatigability, sensations of coldness, sleeplessness, nervousness, and the impression that her "legs wanted to go in opposite directions."

In 1951 a diagnosis of fibrositis was made elsewhere and cortisone prescribed. In the same year, she had been operated upon for a cervical rib. Neither of these procedures relieved the aching and stiffness. Snapping sensations in the neck soon developed. The feelings of complete exhaustion were usually treated with rest, change of job, or change to a warm climate. All of these afforded only transient relief, however.

The patient was an attractive, slightly built, cooperative young woman whose rather child-like demeanor was interrupted by weeping when she discussed her child-bearing. There was the slightest degree of fusiform swelling of one finger. Several months later she developed synovitis with slight effusion in one knee. Laboratory findings were borderline as to sedimentation rate and hemoglobin values. X-ray examination revealed normal findings. Our diagnosis was a low-grade, early, rheumatoid arthritis. The patient was the youngest of six sisters, she was the only one of the six who had not married, and she still lived with her widowed mother. Our findings suggested that many of her complaints were reactions to emotional rather than to physical stress.

Social Casework Services.—The clinician reviewed his impression of the total medical problem. Without minimizing the physical nature of the complaints, he explained them in their possible relation to past and present tension situations. He presented the relation of the two as a possibility worthy of further investigation. The caseworker was described as the member of the clinician's staff who might continue with this aspect of the clinical investigation.

In the initial interview with the social worker, the patient appeared extremely polite and proper but gently resistant. Her discussion of recent stress situations, however, revealed that she hoped for some encouragement in the idea that it was acceptable not only to have feelings of loss and deprivation but also to express them.

During the week that followed the initial interview, the patient, of her own accord and without any encouragement from the caseworker, mailed in a four-page detailed summary of past events and her reactions to them. In the second interview, the patient was not so reticent or reluctant to talk, nor did she attempt so completely to appear to be unaffected by the events which had occurred. She was able to say that in her family she was the "baby" who was never really involved in doing things for herself. She seemed almost impatient to discuss the details of the conception of her child and the pregnancy, which had occurred shortly after the death of her father. She appeared puzzled by the lack of feeling displayed by herself and her family to these events, for she felt she could no longer delude herself into believing that she or they had remained unaffected.

In ensuing interviews, the patient progressed in her ability to discuss her relationship to her family and her need for encouragement rather than pity. The course of the physical complaints was erratic. The presenting symptoms continued and, for a time, appeared to be growing worse. At the same time, the patient was

in the process of leaving her position and moving toward one of her usual long retreats into invalidism. With consistent opportunities for the patient to discuss her distress and the prospect of a possibly long drawn-out program of treatment, and with the chance to ask for and obtain emotional encouragement for the effort she was making, she soon obtained another job. Conservative medical management was continued.

The interviews progressed from a discussion in which symptoms were blamed by the patient upon climate and unknown physical trauma to the acceptance of tension as aggravating, if not causative. The patient learned to realize that there was a relationship between physical tenseness she experienced and the chronic effort she made to protect herself from becoming involved with men. As she became aware of the source of this feeling, she became able to separate it from present reality. She not only began to have dates with men but realized that she was no longer ill-at-ease in their presence. The patient became increasingly capable of separating herself from the intense feeling that she had had toward her family, realizing that they had been wrong in reacting to her pregnancy with an almost complete suppression of feeling and that her own feelings of guilt had made it impossible to protest against their placid reactions. Eventually she was able to say rather spontaneously, "Now, maybe, I won't have to punish my family by making them take care of me." Most significant is the fact that these interviews were the first opportunities the patient had ever had even to recognize her own reactions.

As the patient put it, "Once you've talked these things out, and settled some things in your mind, you don't use yourself up thinking about them." She no longer is preoccupied, withdrawn, or tensely on guard. In the most recent medical examination, the clinician found that the patient's joints were objectively normal and asymptomatic. Perhaps this patient will continue to make efforts to achieve a normal adjustment and then, possibly, retreat. During the present treatment, however, she has made substantial progress. Her ability to think about herself constructively and to make more adult adjustments during this period indicates that she should continue to improve.

CASE 2.—This patient was a 26-year-old white married man, a plasterer, who came complaining of pain in the left shoulder and neck. This first occurred about two years prior to consultation and eight months after his hospitalization for suspected "bulbar polio." For three months after the onset, the patient was unable to work because of his pain and stiffness. Symptoms were worse at night, during week ends, and during periods of inactivity. Two weeks before, these symptoms became worse, coincident with his return from a vacation. The patient had had several clinical and x-ray examinations, which disclosed no organic disease. Various forms of treatment with physical modalities had produced little permanent relief.

The patient described himself dramatically as a person who had required medical attention for a series of illnesses ever since the age of 2 years. "Pneumonia" when he was 2 years old had been succeeded by injuries and fractures while at play, always at "great cost" to his family and productive of intense anxiety. The last experience with hospitalization was for suspected "bulbar polio." The patient emphasized the seeming impossibility of avoiding repeated illness.

Six weeks before, the patient developed a painless tightening of his throat when he swallowed. To relieve this, he took a two-week vacation away from home. The swallowing difficulty subsided but was supplanted by the pain and stiffness in the shoulder and neck. Examination revealed a husky, well-groomed young man who perspired freely. There was striking paucity of structural abnormality. The initial diagnostic impression based upon our findings was that we were dealing with a psychoneurotic personality, with a long series of illness experiences, culminating in the recent episode of "globus hystericus" and finally in an episode of cervical pain probably related to chronic emotional tension and anxiety. Careful analysis did not reveal any sound basis for the patient's suspicion of a recent "bulbar polio." The possibility of a recent herniation of a cervical disc was considered, but could not be proved.

The patient's home adjoined that of his parents. He was accompanied to our office by his mother and a maternal aunt, whose overt expressions of anxiety were far out of proportion to the man's complaints. In his presence, they spoke of the patient as if he were a helpless child. Some of the stress situations in which the patient was trying to function were as follows: the mother was suffering from pernicious anemia; the father, partially invalided by "heart trouble," had been hospitalized occasionally, presumably for recurrent paroxysmal tachycardia; a sister had a history of rheumatic fever.

The clinician helped the patient to discuss progressively many sources of stress, from his reactions to the suspected "polio" to the added business responsibilities he assumed with his father's illness and the pressure he experienced in adjusting to marriage and fatherhood. He was able to relate his symptoms to tenseness. The patient reacted well to the clinician's review of the favorable physical findings and reassurance concerning his physical condition. He was further encouraged to attempt to continue working, despite discomfort, with the aid of mild sedation and analgesia.

Social Casework Services.—The caseworker was introduced as the member of the clinician's staff who might help by exploring ways of working out the patient's problems constructively. An interview with the caseworker was made part of the patient's third visit. Emphasis was on the emotional and social aspects of the problem from the start. The task of determining and alleviating the personal and environmental stresses was, therefore, approached as natural and logical.

The caseworker found the patient obviously tense, wanting to be successful in his own right, and feeling himself hampered by his illnesses and his parents' reaction to them. This was indicated almost from the start by his resentment to remarks made by relatives that he had nothing to worry about "because his father would stand the expense." He appeared to desire some avenue of release for his conflicting resentments and doubts; yet, at the same time, he wanted reassurance regarding his own abilities.

At first the patient needed reassurance that talking about himself and his feelings about his family was not wrong. He asked if other people had similar feelings and had also sought help as he had. He indicated that he needed advice that might enable him to proceed in an increasingly mature fashion. The problem of taking over as boss from his invalid father was difficult. With active support by the caseworker, the patient eventually progressed to the point where he could examine his involvements fairly closely and assume the increasing responsibility for management, which he really wanted, as the father gradually relinquished full control to the patient.

After a number of interviews, the patient was able to report that he no longer required medication. His symptoms subsided, with mild recurrences, however, at times of special stress. He considered himself relieved of his presenting symptoms and, even more important, of the fears that accompanied them.

With continued support from the clinician and the caseworker in the past year, the patient has been able to withstand a series of extremely serious crises: the death of his sister, the illness of and a miscarriage by his wife, his parents' continued illness, and a full schedule of work and business responsibility. During all these crises, the patient lost no work because of illness and assumed full responsibility of running the business.

At the time of writing, the patient appears unconcerned about his physical condition, never refers to his previous fears about "bulbar polio," and is more inclined to discuss his anger toward his mother, "who makes things difficult" for him by "being too good." He also expresses the desire to progress to the point where he can handle sources of tension by himself. Although he may not be completely successful in doing this, he now has developed ways of working on his own problems that may preclude the crises of the past.

CASE 3.—This patient was a 36-year-old, white, married man, a coal mine foreman, who in the previous year had noted pain in the right "hip region" after any marked exertion, then soreness of the proximal joints of the fingers. Examination revealed a well-developed, healthy-appearing man who showed considerable anxiety over the possibility of developing a crippling arthritis. Detailed history, clinical examination, and pertinent laboratory and x-ray examinations resulted in a diagnosis of psychogenic rheumatism.

The patient's discussion of his discontentment with his job, which his wife wanted him to keep, however, led to the impression that conflicts over his present job might be one of the major

immediate sources of stress. On discussion of the findings with the patient, an effort was made to indicate the possible relation of the patient's conflicts to his present tension and joint pains. The clinician discussed with the patient the availability of a medical social caseworker and arranged for referral.

Social Casework Services.—In the first interview with the caseworker, the patient appeared to be a forceful, alert, remarkably sensitive man appearing much younger than his stated age. His resistance to talking about himself and his feelings seemed due to a conscious effort on his part to avoid the possible implication that he was incapable of handling his job and its stresses. Despite his joking about the connection between physical pain and job adjustment, the patient appeared to want help, not only to offset his general dissatisfaction with himself but to discuss the problems of his job.

The patient accepted the interviews with the caseworker as an opportunity to express his feelings of pressure, to examine their source, and to consider what adjustments he might make. His greatest problem, he recognized, was that of being afraid to say too much on the job and of doubting what he actually did know about it. With minimal direction the patient was able to suggest that this cautiousness in speaking reminded him of an event that had occurred many years previously. He had quarreled with a girl friend and had refused to speak to her. Shortly afterward she became ill and died. "Since this death something made it impossible to speak out without feeling guilty." During ensuing interviews, however, the patient spoke of the positive effect of talking to the caseworker about things he had never discussed with anyone. It was as if the caseworker's sympathetic, nonpunitive attitude in the interviews enabled the patient to realize that he need not be the belligerent, "always right" foreman he had thought he must be to control the men under him.

In a subsequent interview the patient was able to consider further reasons for his fear of hurting, his fear of not being right, and his dislike for his job. His father was a "tough," gregarious man who could "give and take" with workers and company alike. It was only through his father's insistence that the patient had gone into coal mining. He now was foreman over men who had worked under his father and who constantly made comparisons between father and son. The patient explained that he even was called by his father's first name, rather than by his own.

Gradually, with direct encouragement, the patient was able to develop some confidence in his own thinking, his own identity, and his own way of living. Although he had applied for another job, the patient found himself more comfortable in his work as a mine foreman. He could express himself forcefully without feeling upset. He could feel that he had some personal integrity whether he liked or did not like coal mining as much as his father and grandfather had liked it. During the period of these interviews, the patient noted gradual improvement in his physical manifestations despite a heavy work program and the stress of family illness.

At the conclusion of treatment, the conflict and rivalry with the father were clearly far from resolved, but the patient had progressed to the point of constructive awareness of his involvement. He was in a better position to decide whether to continue as a foreman, fully realizing that he was under pressure to outdo his father, or whether to accept the fact that he might be happier in work where there was no daily pressure to equal or to outdo his father, without regard to his own interests and satisfaction. In the year after the conclusion of treatment, the patient voluntarily reported by letter that he made a satisfactory change of position, that he was free of symptoms, and that he was generally contented in his adjustment.

Comment

These patients have not been described as typical of the average patient in a physician's office practice; nor are they typical in their amenability to help through social casework services, where medication or physical treatment is not the major therapeutic indication. Their cases have been presented, however, to show that for selected patients additional therapeutic resources should be available and may be beneficial. This is not basically a new idea but is, rather, a reemphasis of what is common knowledge. It illustrates the fact that the pessimism with which one may regard patients who do not require or do not improve under the more usual modalities of medical treatment may not be entirely justified if it is realized that still another modality of medical management may be useful and should be readily available.

The resistance of the patient to acceptance of social casework services is usually regarded as the basic hurdle. If these patients are accurately appraised as expecting too much, as being too passive or too aggressive, it becomes necessary to work with whatever basic resistance to change they may have. The family physician is generally the first receptor of such resistance, and it is he who may be most successful in dealing with it. If the problems of such patients are too involved or time-consuming, which they generally are, the assistance of the social caseworker may be invaluable. The addition of a medical social caseworker to a physician's staff may not always be practicable or expedient. Many communities, however, have family casework agencies available for counselling. Some communities have caseworkers in private practice available for the patient who might resist agency referral.

The three cases cited do illustrate that the special skills of the medical social worker may enable the patient not only to accept the physician's diagnosis and interpretation of his medical problem but also to undertake more willingly the therapeutic program recommended. The medical caseworker may assist the patient to participate more fully and more readily in the doctor-patient relationship and in the processes of medical diagnosis and treatment.

Objections to this approach are recognized. The resistance of the patient to additional diagnostic or therapeutic procedures may be expected. Some patients, and even physicians, may feel that referral for casework assistance implies mental illness. It is also essential for patients to avoid any possible implication that they are "social cases" or that they are incapable of completely handling their own problems. Furthermore, the patient already in pain and under stress may want to limit the area of exposure or may wish to restrict the number of his involvements. The contribution of the social caseworker to medical care, nevertheless, has many positive aspects. His primary contribution is his regard for the individual as a member of society within a specific group and culture; this view helps him see the effects of stress reactions to earlier conflicts, influences, many life experiences, and pressures within a specific culture upon the health of the patient. The determination of these stress reactions is of vital importance to the physician who must deal with their relevance to the health of his patient.

Selected patients who have been helped by the social caseworker, such as the three described above, have seen his assistance as proof of their physician's real interest in them. They have felt that the physician has made it possible for them to attempt to work out their problems. They have been impressed by the explanation and understanding of the stress reactions that have influenced

their physical condition and produced their discomfort. Most of all, however, they have been impressed with the opportunity to enjoy the advantages of the practice of comprehensive medicine.

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RECENT SOCIOLOGIC TRENDS IN MEDICAL PRACTICE

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• Both industrial health plans and union health programs have been expanding to the point where each is now expressing its concern with the health of the whole man. In some instances, management has had to supply medical service that was not available in the community. Union health plans similarly run the gamut of possibilities, some offering only insurance and others providing medical care.

The conference method is a good and safe way to promote understanding and make genuine progress. Representatives of state medical societies, of management, and of labor have found it possible to discuss the basic issues frankly, and the meetings tend to dispel animosities and foster mutual respect.

In the early 1900's, I cast my lot with what has turned out to be a new specialty in the practice of medicine. At the time it was somewhat unorthodox to go into industrial medicine. In 1955 "occupational medicine" achieved board status, as a part of the Board of Preventive Medicine. This, I believe, is a measure of the growth and maturation of the specialty, and will add stature to those who practice medicine in behalf of industry. Then, a little over two years ago, I was offered the chance to become medical consultant to a large labor union. In my more than 30 years of industrial experience as medical director of the Eastman Kodak Company I learned to know the attitude of management toward the health of its employees. Now, in behalf of the International Association of Machinists, I am learning the attitude of union leaders regarding the health needs of their members.

From the viewpoint of enlightened management and enlightened labor leadership (and I can vouch for the high quality of the leadership in each of my experiences), there seems to be little difference in the goals. The worker carrying a union card seems to be quite the same kind of human being, with the same health problems, as the one who does not do so. I regard these two developments, industrial medicine and union health and welfare plans, as the two significant trends of the day. They are departures from private practice, and, as they grow in numbers and extent, they demonstrate rather definitely that medical care can and is being provided in new ways. Each of these developments has had a very different starting point. Industrial medicine has in most instances restricted itself to occupational medical needs, i. e., medical and health problems on the job, whereas the interest of labor unions has been with their members' general or nonoccupational medical needs. From these very different beginnings, both industrial health plans and union health programs—at least, the most progressive of them—have expanded to the point where each is now pronouncing its concern with the health of the whole man. This transition has been an interesting one, but is by no means general.

Changing Role of Industrial Medicine

But let us look at one area at a time: first, the changing role of industrial medicine. It began with a limited and somewhat selfish interest in traumatic injuries on the job and has, over the years, broadened its program to include such things as preplacement examinations, diagnostic examinations, counseling regarding illness that causes absence from work, periodic examinations where workers are exposed to occupational hazards, rehabilitation of the injured, and other aspects of a preventive health maintenance program.

In my own experiences at the Eastman Kodak Company and with other developments in industrial medicine, I have seen industrial medicine grow from accident first aid to the more comprehensive inplant service, with prevention as the dominant theme. Gradually more and more employers are seeing the opportunities that industrial medicine offers for a more stable work force, with better morale. Employers have learned that a healthy employee is a more productive and dependable employee. Enlightened management in some instances has come to see some of the possibilities in providing medical care for the "whole man" and even for his family. There are different approaches to this problem, depending upon circumstances. Often, no medical service being available in the community, management has had to establish something, as in the case of the Southern Pacific Railroad, which in 1868 organized the first major industrial medical prepayment program, which is still in existence. On the other hand, in a well-developed community, such provisions are unnecessary. Kodak has always believed that anything beyond inplant problems and needs was a community and employee responsibility, with employer participation through insurance protection to help in paying for much of this community care. There are as many variations as there are industries.

Inplant medical care has expanded in some instances to include certain phases of outplant care. While I can-

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not say that this has become a trend as yet, there is increasing talk of the need for such care. Again and again, management, with its success in reducing accidents on the job and reducing lost time by prompt and adequate medical care, has asked, "Why can't we reduce the absence loss due to nonoccupational sickness, which is nine times the absence rate from accidents?" In some instances this has been accomplished, but too often a sufficient follow-through is not provided. Sickness absence is coming to be the *sine qua non* for industrial medicine. Its reduction is the most practical benefit any health plan can provide and furnishes a meeting ground for the aims of both labor and management. Again, management has asked, "Why cannot the untimely breakdown of valued executives be avoided?" Just as with large sums invested in machines, which receive the most meticulous care, management argues that investments in personnel should also be preserved. That is a calculating viewpoint, perhaps, but it is practical and gives an acceptable basis for a valid health maintenance program.

There are hard cash figures to justify such an attitude.[1] One factory reported it saved four dollars for every dollar spent on its health plan. Another study showed that an average employee working in a plant with a health program was absent only four days a year because of sickness, compared to nine days per employee in a company without a plan. Other surveys [1a] of large numbers of companies with health programs have reported reduction in compensation premiums averaging 30.3%, reductions in accident rate amounting to 43.5%, reductions in sick absence averaging 25.6%, reductions in labor turnover averaging 29%, and reductions in occupational disease averaging 45.6%. These figures clearly demonstrate the value of occupational health services. However, industrial medicine as commonly discussed exists chiefly in larger manufacturing plants. Fully 70% of workers are in plants of small size, where medical service does not exist. In other words, not more than 20 to 30% of those employed in manufacturing industries have anything like adequate on-the-job medical service, while those employed in construction, mining, agriculture, and such industries have very little medical service at all. One of the questions before us now is the benefit labor health plans can possibly provide, bearing in mind particularly the small companies where no medical services exist.

Growth of Union Health and Welfare Plans

During the long time that I was involved with growth of industrial medicine, I was completely unaware of the parallel and even more rapid growth of union health and welfare plans. While there are no exact figures available, reliable sources have estimated that in the five-year period from 1948 to 1953, for example, the number of workers covered by health and welfare benefits rose from about 2 million to about 16 million, the number of dollars expended from about 200 million to about 1.5 billion. This represents a considerable purchasing power, and with it is a growing clarification of what it is they wish to purchase.

The solutions that union health plans have attempted throughout the country run the whole gamut of possibilities, rather than falling into any one pattern.[2] There are two basic kinds of programs: those offering only insurance and those providing medical care. Within each of these there is a wide range. In insurance programs, the range is from simple, limited coverage to a rather complete package plan, including such things as life insurance, sick allowance payments, hospital and surgical expense payments, sometimes medical care within the hospital, and recently major medical expense coverage. In medical care programs, the range is from referral or diagnostic service only to comprehensive family medical care. In these medical care programs, sometimes a large union will go it alone in setting up a health center, which may be limited to ambulatory service, as in the case of the hotel trades union in New York, or which may be on a comprehensive basis, as in the case of the teamsters union in St. Louis; sometimes it will join forces with other unions in the area, as the American Federation of Labor unions have done in Philadelphia; and sometimes it will become a part of a larger community-sponsored plan, such as the Health Insurance Plan of Greater New York.

Whatever their present status, however, the aim of union health plans is generally the same, even though some of them are just in the initial stages of wondering how to go about fulfilling this aim—and that is for truly comprehensive family medical care on a prepaid basis, with special emphasis on prevention, through health education, early detection and treatment of medical problems, and prompt rehabilitation and return to productive work. This is the essence of what labor and management sometimes talk about when they get together about the bargaining table.

One of my tasks as medical consultant to the machinists is to write a weekly health column for the union newspaper for over 800,000 members and their families. And the more than 1,000 letters that come each year in response to it point only to greater complexity in trying to chart an adequate program by which machinists can use their health and welfare funds so as to obtain the best possible medical care for themselves and their families.

It might be well to clarify just what union health and welfare funds are and where they come from. They are funds devoted to the health and welfare needs of labor union members. During the war the National War Labor Board allowed contributions by employers for union health and welfare programs as a fringe benefit in lieu of wage increases. Since that time the financing of these programs has been made a matter of collective bargaining, and their cost is being met increasingly in this way. The money so obtained may be paid into a formal trust fund, which handles its distribution to a program that provides medical services, or, in less formal arrangements, the money may simply be paid by the parties to an insurance company, a Blue Cross office, or a health center, to purchase insurance or health services.

The term "union welfare funds" is somewhat of a misnomer, because when these funds are obtained through collective bargaining, management has by law an equal voice in their administration. There are countless numbers of funds in operation, varying from small local affairs to those that affect certain workers in many parts of the country and have millions of dollars to spend.

The push for welfare funds is not just an artificial creation of union leaders; it is quite the contrary. Many of today's unions had their start in mutual benefit associations, formed among workers years ago, to mitigate the expense of illness and funerals. Instead of being an entirely new development, as is often thought, it actually has many roots, going back well before the present time.

What Unions Want and Need in Medical Care

As I work with the machinists' health and welfare possibilities, I am becoming increasingly convinced that there is no over-all national program that the union could develop that would be in any way so successful as the sum total of more adequate local programs, worked out together in each particular community. However, even though there is no set pattern to be suggested for the solution of their medical needs, it is apparent that their needs and desires are centering around two ideas: one is for prepayment of medical care, total prepayment if possible, and the other is for comprehensive care, truly comprehensive if possible. The machinists—and other groups of consumers of medical care—feel that, by sharing the risk, through their very numbers, on a sound actuarial basis, these goals can be achieved. And they would welcome the opportunity of working with the medical profession and other allied groups in an effort to obtain them.

David J. McDonald, president of the United Steelworkers, expressed this feeling in an address before the Annual Conference of Blue Cross and Blue Shield Plans, to which plans the collective bargaining agreements of his organization pay more than 30 million dollars annually in premiums. He said:

> It is not my desire, nor the desire of the United Steelworkers of America, to change the pattern of medical practice in our country. The great and growing demand of steelworkers, and of all workers, for comprehensive pre-payment medical programs gives the medical profession and your organizations the chance to demonstrate the kind of leadership the world today seeks from the United States. Yours is the opportunity to develop, within the framework of private practice and freedom of choice for the patient, a method by which the burdensome costs of medical care may be met through privately organized prepayment plans.[3]

What this all seems to add up to—whether it is the expression of labor, management, or any other lay group —might be called "the expanding role of the consumer of medical care." And the consumer is expressing himself, not only as an individual, but as a member of all the groups and institutions in which individuals come together. Both of these parallel pioneering movements—industrial medicine and union health programs—represent group concern about the prevention of disease and medical care. For some reason, this very group concern has alienated these movements from much of the medical profession. Perhaps it is because of the third parties involved, in one instance management and in the other the union. Groups of doctors have somehow shied away from listening to groups representing the consumers of medical care. Yet one of the most exciting facets of my particular role in medicine has been to try to learn what the consumer wants.

Role of the Medical Profession

Cooperation from the medical profession has become most important at this stage of the game. Many union leaders believe that organized medicine has been unwilling to admit that better service for a greater number is needed, or that consumer groups have any constructive ideas concerning medical care. The United Mine Workers, for example, has had occasion to change its attitude considerably in this respect during the last few years. Dr. Warren Draper, the fund's executive medical officer, and I are members of the American Medical Association's Committee on Medical Care for Industrial Workers. About three years ago he asked our committee if we could help him on some problems confronting the fund. Medical service in the coal regions has not been of the quality it should be. After presentation of some unpleasant facts to the committee, which in turn presented them to the Council on Medical Service and the Council on Industrial Health of the Association, it was decided that first of all the committee should make a survey to verify the facts presented by Dr. Draper, and then present them to each state society involved, with the hope that they would take some action.

The United Mine Workers Welfare and Retirement Fund started its program on the basis that for good quality medical service they would pay going rates. Unfortunately, some doctors in the soft coal region were unaware of the purpose of the program or misunderstood its aims. They came to look upon this fund as a "gravy train" and to abuse it in several ways. Overhospitalization and unnecessary surgery sometimes were indulged in, and excessive charges made. This drain on the fund called for some controls. Certain doctors were ruled unacceptable, and, in view of the inadequacy of hospital facilities, the building of United Mine Worker hospitals was begun, with many misgivings on the part of many doctors in the area. It was this situation our committee was asked to consider.

The American Medical Association, of course, has no authority over the physicians in any state. Such responsibility rests solely with each state society. In the fall of 1952, a first conference with officers and liaison committees of the five southeastern state societies involved was held. Facts were laid on the table, and each side spoke its mind. Some recommendations were made, and there seemed to be hope for the future. Three other conferences have been held since, with encouraging results. Members of the state societies have not agreed on every point with the fund program, but they show a willingness to cooperate and a better understanding of the problems involved. The Tennessee Medical Association, through its Tennessee Foundation, has already provided facilities and medical service in two neglected rural coal mining areas. This points the way for other efforts by organized medicine. Today the attitude of the United Mine Workers toward organized medicine is greatly different from what it was in 1952. The union is now pleased to be working with the doctors on such a cooperative basis.

As one who has had the opportunity to see something of the points of view of both management and labor, and having watched and participated in these conferences be-

tween the United Mine Workers and the five state medical societies, I am convinced that the conference method is a good and safe way to promote understanding and to make genuine progress.

Labor Health Education in California

Another very interesting development is taking place in Los Angeles. This is the Labor Health Education program, carried on by the Institute of Industrial Relations of the University of California.[4] The labor movement in Los Angeles now shares the responsibility for the expenditure of some 25 million dollars annually on health care through negotiated health plans. Labor leaders are acutely aware of the need to find solutions to problems arising from the inadequacy of medical care benefits, the mounting costs of medical and hospital care, abuses of cash indemnity plans, and the opposition of organized medicine to certain forms of health plans. Top officers of 80 local unions that are actively concerned with health problems formed a Health Plan Consultants Committee.

One of the most important decisions faced by this committee at the outset involved its relationship with the medical associations. It was aware that in other areas of the country the relations between organized labor and official representatives of the medical profession had been less than satisfactory, and it recognized the importance that a cooperative attitude on the part of the medical profession could bring to its program. It proposed that an attempt be made to ascertain the attitude of the medical associations toward an improvement in the operation of existing health plans, and officers of the Los Angeles County Medical Society agreed to meet with officers of the committee. At their meetings, representatives of the Health Plan Consultants Committee emphasized that their group represented unions with members enrolled in all kinds of health plans: commercial insurance, Blue Cross, Blue Shield, Kaiser Foundation, and Ross-Loos. It pointed out that it was not advocating any particular plan but was interested only in improving all types of voluntary health plans to the end that the ultimate objective of the labor movement, comprehensive medical care for workers and their families, would be attained.

Officers of the medical society, in response, emphasized their concern with the enrollment of so many unions in closed panel plans and expressed their opposition to plans not based on fee-for-service payment to doctors and that did not permit a free choice of the doctor. Subsequent meetings were held in an effort for both groups to better understand each other's problems, and these meetings were successful in creating an atmosphere of understanding and mutual respect. While no solutions were agreed upon, agreement was reached that the main problems to be solved were those of the unpredictability of medical costs and the tendency of doctors to assume that coverage by health plans increased the patient's ability to pay and justified higher charges.

The president of the county medical association [5] urged that the doctors cooperate closely with the Health Plan Consultants Committee in "determining the shape of union health plans, including both multiphasic screening and cooperative fee setting." He told members of the medical society that "it would be extremely foolhardy if the medical profession were to close its ears to labor's requests for cooperation, large or small. I have pointed out that we are being offered almost simultaneously a first and last chance to shape the future course of medical labor relations. If we muff this chance now, the blame must reside with us."

He went on to say that "generally as a profession we are maintaining the traditional concept based upon the patient's ability to pay. That concept is very acceptable when applied to an individual patient . . . exclusive of union health contracts. But when it comes . . . to labor contracts which will cover a mass of individuals, it must be replaced with a realistic formula that can be used as a steady and reliable index of medical costs."

What have been the results of this Los Angeles program? After two years there is still a disposition to work together. Perhaps the reactionary elements have asserted themselves somewhat more, but mutual suspicion and unfounded animosity have been dispelled. Leaders of both groups have found a great deal in common with each other. This is a basis for future achievement. Better mechanisms have been developed for handling complaints about doctors. The Los Angeles County Medical Association has developed a reasonable fee schedule, which it proposes to adopt as a guide for fees to insured patients. And two patterns of group practice prepayment plans are now developing that will at least neutralize some of the opposition of the medical profession: (1) acceptance by plans with closed panels of the principle of multiple choice of plans, whereby a group enrolling must be permitted a choice of alternative plans, and (2) the development of diagnostic centers as a supplement to ordinary insurance company, Blue Cross, or Blue Shield plans, in which the patient who goes to the diagnostic center then can either use a center doctor or can choose an outside doctor for treatment. Thus it can be seen that, with such freedom of choice, the objections to closed panels is pretty well dissipated.

Mr. Ted Ellsworth, Chairman of the Health Plan Consultants Committee and Administrator of the Motion Picture Health and Welfare Fund, summarizes the two-year experience as follows [6]:

> In the two years since the Committee was organized . . . we have seen an immense change in the thinking of the union people and the administrators of these funds. Two years ago we thought in terms of insurance. . . . Now we are thinking in terms of health . . . and medical services when we set up and administer a program. . . . Labor recognizes that health problems are community-wide and that they can be most effectively met through broad community action. Although labor has organized the Health Plan Consultants Committee, and this group has taken many steps in the direction of obtaining better medicel care for working people, we realize that the cooperation of the interested community groups is vital.

Economics of Preventive Medicine

There is a fear among some doctors of going too far too fast in seeking to make comprehensive care available to too many people. They feel that this popularization

of comprehensive care, preventive medicine, and health education is premature and will lessen their ability to handle the really important problems of diagnosis and treatment. Fortunately, however, this fear is unfounded. The success of preventive medicine in relieving both the load and the cost of medical care has been well documented both by the experiences of the Health Insurance Plan of Greater New York [7] and the United Mine Workers.[8] Dr. George Baehr, medical director of the New York plan, has shown that only 10% of professional services under the plan are required in hospitals. His principal concern is not with over-use of preventive medicine on an ambulatory basis; on the contrary, he is wondering how to increase this use. The United Mine Workers plan has also had experiences where previous hospital utilization was cut in half by providing good ambulatory care. This kind of information is of interest both to the administrators of medical care programs and also to those of us concerned with the best utilization of community health resources. It should be explained that the United Mine Workers fund did not originally provide anything but hospital care. Ambulatory care for the most part remains in the hands of the mining camp physicians who work under the traditional "check-off" system.

Perhaps the spread of union welfare plans has brought us to the time when we must think in bold terms of a total solution to our health problems. It seems to me that Mr. Benson Ford's [9] timely remarks before the American Hospital Association have significance here. He said:

> Industrial group insurance plans . . . are setting the pattern of today's and tomorrow's demands upon hospitals, doctors, and insurers. Important decisions affecting all of you in the field of health are being improvised in thousands of firms all over the country. In my opinion, they are being made without any realistic understanding of what they involve. So far as I have been able to determine, there has been no answering effort by the *health industry* to measure the coming demand and to help organize our facilities to meet it. That, to me, spells possible trouble ahead.

He points ahead to some of the implications of what he calls "the massive intrusion of industry and organized labor into the health picture." He continued, "To all appearances our health plant is not uniformly capable of handling even the present demand, with its swiftly-changing patterns, and there is no sustained effort to anticipate and meet any increasing demand."

Both of these types of programs—industrial medicine and labor health programs—are a source of casefinding and referral for the private physician. This flow of information about patients will increase when the physicians in the community are willing to work more closely with the two groups of agencies. Such active cooperation not only strengthens patient referral and medical care, but it also provides special opportunities for a dynamic health education program.

In practical terms, what all of these trends and implications come down to is a readjustment of community planning, with greater use of "the health team" approach. This calls for more imaginative planning, more creative thought, and more cooperative and vigorous action.

Channel to the Community

While individual doctors have spoken and acted magnificently in support of these problems, the record of our medical groups for positive political and social action has not been very great. Yet our medical organizations are our channel to the community. While our person-to-person public relations have been on a high level throughout the history of our profession, the group-to-group public relations, as doctors-and-community, are in their infancy. And we have been largely reluctant even to accept this relationship as desirable and necessary.

In my opinion the medical profession is being challenged today as never before by far-reaching events—events that need our professional counsel. At all times it must be remembered that any progress or change should be based on teamwork, participated in by all of the medical profession and its ancillary co-workers. For it must also be remembered that the physical, mental, and social well-being of those gainfully employed is of paramount importance if America is to remain strong.

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Biopsy for Muscular Dystrophy.—We believe the muscle biopsy to be of considerable value as an aid in the clinical diagnosis of muscular dystrophy, but only if the histologic appearance is quite characteristic. . . . Where it [seems] inconclusive, it may be that some difference in quality of the disease [exists]. . . . As in any application of the biopsy method, the value depends to a great extent upon the choice of tissue. In muscular or neuromuscular disorders, the sampling cannot be as precise or as extensive as one would like it. When one realizes the differences which may exist in various levels of the same small block of tissue, it is surprising how often a consistent histologic picture is present. . . . The changes are roughly quantitative as well as qualitative. . . . The general features of [a] specimen, such as the amount of fat in relation to the amount of muscle and the specific changes in the muscle, [permit] an accurate quantitative prediction of the degree of clinical involvement. Thus, all . . . patients with marked clinical debility also [have] far-advanced histologic changes. On the other hand, these histologic alterations seem to precede the clinical changes, since in a number of . . . patients [with] less [involvement] muscle strength [is] relatively well maintained even though the biopsy [shows] far-advanced disease. . . . In terms of the subsequent course of the illness biopsy [has] no evident deleterious effect on muscle strength.—G. H. Fetterman, M.D., M. J. Wratney, B.S., M.Ed., J. S. Donaldson, M.D., and T. S. Danowski, M.D., Muscular Dystrophy, *A. M. A. Journal of Diseases of Children*, April, 1956.

THE SOCIAL WORKER AS A TEACHER IN MEDICINE

WITH SPECIAL REFERENCE TO THE HOME VISITING PROGRAM AT THE OKLAHOMA UNIVERSITY SCHOOL OF MEDICINE

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• Information about a patient's domestic, occupational, and community background is often essential in making a diagnosis and discovering the etiology of his trouble. It may also have to be taken into account in deciding on therapeutic and rehabilitative procedures.

The social worker, because of training and experience in obtaining such information, has become an accepted member of the medical team. In addition, the social worker has taken an active personal role in education, particularly the supervision of a program of home visits by senior medical students.

From this program the medical student gains not only an appreciation of the multiple etiological factors that result in illness but also a tactful approach to families and some understanding of the community resources available to the handicapped.

Medical education is in a period of transition. The changes occurring reflect a major trend in the philosophy of disease, the trend toward the belief that multiple rather than single factors are operative in illness. They also reflect a change in the relative importance of certain groups of disease, with an increase in the importance of chronic disease. Both the change in philosophy and the change in disease pattern give increasing importance to the social and environmental factors in illness. Concurrent with these changes, social workers have taken a role of increasing significance in dealing with patients and their problems. They have brought their skills and knowledge to bear in many of the problems that patients and their families have in adjusting to illness and in addition have done much to promote and expedite referrals to agencies offering specialized services. With their increasing importance in patient care, they have also assumed a more prominent place in medical education. Social workers have become accepted members of the medical team and are, at many medical schools and hospitals, regular participants in conferences on patient care. At the Oklahoma University School of Medicine the social worker has also become a teacher in her own right, imparting to the student that portion of her knowledge and skills that can prove of value to him in the practice of medicine.

Preparing the Background

The background for the social worker's new role in medical education is set in the first three years of medical training. The teaching program is designed to establish the multiple-factor theory of illness firmly in the mind of the student.[1] In addition to the more traditional aspects of medicine, the importance of social and environmental factors and of interpersonal relationships in illness is constantly stressed. The changes in disease incidence and the implications that these changes hold for medical practice are brought to the attention of the student, and the specific functions of the social worker within this framework are detailed. In the third year of training, the medical student is brought into a working relationship with the social worker. The social worker may obtain special data about the patient, his family, or the situation in which he finds himself. She participates in teaching conferences with psychiatrists, pediatricians, internists, and students. She helps in planning for the patient and carries out those duties for which her training especially suits her. This is the usual role of the social worker in medical education.

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In the senior year, this role is expanded in connection with the comprehensive medical care program of the general medical clinic.[2] One aspect of this program concentrates on continuity of patient care between clinic and home community. New patients from selected counties are discussed in conference on the day of their initial visit. The physician in charge of this program and a social worker are always present at these conferences with the students. Pertinent facts about the patient, his illness, and his environment are reviewed and discussed, with the social worker taking an active part in these discussions. A plan of care is formulated and a letter written to the referring physician and county health officer. The social worker assists with referrals when necessary and works with the patient and his family wherever this seems indicated. About 800 cases are discussed in this manner during the course of the senior year. This allows considerable contact between student and social worker and increases the student's understanding of the social worker's contributions to patient care.

Home Visiting Program

In addition to these functions in the comprehensive medical care program, the social worker has taken an active personal role in education in connection with another aspect of medical care. With the assistance of the W. K. Kellogg Foundation, the Oklahoma University School of Medicine has, for the past two years, had a social worker whose major concern has been the supervision of a program of home visits by senior medical students. This program is under the general leadership of a physician with a joint appointment in the departments of medicine and preventive medicine. The social worker discusses the visits with the students individually,

imparting to them those attitudes and techniques that will be of use in eliciting information, in evaluating social and cultural forces affecting illness or adjustment to it, in discerning pertinent interpersonal relationships that may contribute to the illness or to the patient's reaction to illness, in discovering strengths and assets in the patient's situation, in utilizing these data to the benefit of the patient, and in finding community resources that can be used to advantage in caring for the patient. The importance of these considerations in medical care, in prevention of illness and disability, and in rehabilitation is emphasized.

This process begins with selection of the patient. A patient may be suggested for a home visit by the student himself or by any staff member working in the clinics. The patient's history is then reviewed by the social worker to determine how much value a visit to the home is apt to have. Criteria of suitability for home visits are left unspecified, but certain general principles guide the social worker in her evaluation. Home visits are thought to be of more value when environmental or interpersonal factors within the home are important in the etiology of the illness or in the adjustment of the patient to his illness. They are of value, too, where environmental and interpersonal factors affect medical treatment, prognosis, or the manner and extent of rehabilitation. There are, however, occasions when purely personal factors such as student interest or a desire to increase student-patient rapport have been considered of sufficient importance to justify home visits, even in cases where environmental and interpersonal factors were well known as a result of clinic visits and where a visit to the home of the patient would not contribute greatly to an increased understanding of his problems.

The case is then discussed with the student by the social worker. The interval in which she reviews the case gives her opportunity, if she so desires, to discuss it with the physician in charge in order to clarify the medical aspects of the case or any obscurities that may be present. In her discussion with the student, attention centers about the following questions: What is the purpose in visiting this patient? What can be accomplished by the visit? Will there be any difficulties involved in acceptance of the visit by the patient or his family? What potential problems should the student be prepared to meet? Instruction of the student develops from a consideration of these questions.

Purpose of Visit

What is the student's purpose in visiting this particular patient? In trying to get specific answers to this question, the social worker induces the student to think in broad sociologic terms. The question easily leads into a discussion of the importance of understanding interpersonal relationships and situational difficulties because of their influence on the incidence and severity of illness and on the type of adjustment that the patient and his family will make to that illness. That this adjustment affects prognosis is a clinical truism. Thus an opportunity is afforded to discuss the significance of family attitudes and community resources in medical care and in ultimate prognosis. Such a discussion held prior to the visit makes it a more purposeful and profitable one.

What can be accomplished by the visit? This is but a further extension of the discussion of purpose. Here the social worker and student can look for missing data that can be supplied by a visit to the home of the patient and thus allow better understanding of the patient and his problems. The social worker can suggest interviewing techniques that will allow the student to gain this information without arousing suspicion, resentment, anxiety, or conflicts within the family. The visit may permit a better evaluation of family members as contributing sources in illness. This was illustrated by the case of a 16-year-old girl with a duodenal ulcer who insisted that her home environment was entirely satisfactory. A brief visit with the patient and her mother made evident the hostile and dependent position she occupied at home.

Evaluation of family members can also locate strengths and assets that can be called upon in time of need. Even apparently "unhealthy" relationships can sometimes be utilized to advantage once they have been recognized. Thus, in one instance, a man with severe psychoneurotic difficulties was visited at home because the student felt that his relationship with his wife was contributing to his illness. His wife also was obviously suffering from emotional conflicts, but their difficulties complemented each other to form a stable pattern that was actually mutually beneficial. Disturbing such a relationship would have been to the disadvantage of both the husband and the wife. It is important, then, to evaluate existing interpersonal relationships so as to be able to utilize them in treatment. The visit may also make possible explanation of illness or medical procedures to other family members, thereby decreasing frictions within the family. This was true in the case of one epileptic who was visited. His family had no understanding of his illness and had imposed major, unnecessary restrictions that made life meaningless to him. Simple explanation was helpful in this case. In addition, visits in the home help delineate situational difficulties and permit the physician to give more precise and practical advice in correcting these difficulties.

Problems Encountered

Will there be difficulties encountered in acceptance of the visit by the patient or his family? Discussion of this question is important more often as reassurance for the student than as preparation for any realistic difficulty. Most patients are pleased to have the student visit them and feel that this is evidence of a genuine interest in them as individuals. Nevertheless, in occasional cases, the visit poses problems to the patient. This was true for one patient who had missed several appointments to the mental hygiene clinic and feared the doctor might be coming to take her to a mental institution. This fear, however, could be anticipated from the information available to the social worker, and the student was made aware of the possibility so that he could ease the tension of the situation at once. Another patient feared that the visit meant that the hospital was investigating his right

to be receiving welfare aid. More commonly, difficulties experienced by patients are the result of shame about their living conditions or a desire to keep other family members out of the picture.

What potential problems should the student be prepared to meet? Again, this is an extension of the previous question but allows discussion of a wide variety of problems of importance in the practice of medicine. In entering a home that is the seat of conflicts and intense emotions, how is the physician able to elicit pertinent information without entangling himself in the family conflict? How can he answer questions or discuss a problem with one family member in the presence of the patient or of another family member without arousing antagonisms or impairing rapport? How can he maintain his role of physician while discussing family affairs and neighborhood events? These matters pose difficult problems to the student, whose training has been entirely in hospital and clinic. Discussion of them can give valuable guidance in learning the physician's role and in increasing awareness of diverse attitudes and emotions in group relations.

The social worker is particularly well fitted for discussions such as these. With her training and experience in working with family groups she has had ample opportunity to acquire sensitivity to dynamic intrafamilial relationships and to learn to deal simultaneously with people whose close ties do not prevent them from having diverse attitudes and conflicting aims. She is well aware of the ways in which interpersonal relationships and "extraneous" situational problems affect disease and adjustment to it. Her training imbues her with a considerable awareness of social roles and of the impact of roles on other individuals. She has a wide background of social and cultural information that is often of great value in effecting a better understanding of problems that arise. And she has a knowledge of community resources and the ways in which these may be used most effectively that is essential to practical planning in solving situational difficulties. In preliminary discussions she imparts as much of this training and knowledge as she can before the visit is made in order to make it as valuable an experience as possible.

After the visit, a conference is held at which all information about the patient, his illness, and his environment, both social and physical, is integrated. The physician and social worker directing the program are always present at these conferences, which may be held with individual students or with small groups of students. The problem presented is formulated in terms of the following considerations: factors contributing to the illness and to adjustment of the patient and his family to it; problems arising from the illness, whether emotional or economic; and the effects these considerations have on treatment and prognosis. A plan of treatment is formulated that will meet the needs of the patient, giving due consideration to all the emotional, social, and economic ramifications of his illness. In this conference the social worker takes an active part in formulating both the problem and the plan of action.

Effects of Program

This program emphasizes well the philosophy that illness is the result of multiple etiological factors. It focuses attention specifically on the varying facets of life that may contribute to the occurrence of disease and to the severity of its manifestations. It illustrates graphically the many avenues of approach that may be used to help patients, even when complete "cure" is not possible. It thus removes some of the hopelessness and futility students so commonly feel when faced with chronic illness. The experience is also valuable in establishing in the mind of the student a broader perspective in preventive medicine. Preventive medicine becomes an integral part of patient care in terms of prevention of disease, disability, and economic handicap, as well as in education toward a fuller and more satisfying way of life.

This program has now been in effect for two years at the Oklahoma University School of Medicine. It is felt that it has established the value of the social worker in her role as an active participant in medical education, as well as in her traditional role as a participant in conferences, a resource for social information, and a liaison with community agencies. Many of her skills can be used to advantage by physicians. Her knowledge and training are valuable additions to the medical curriculum.

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1. Bird, R. M., and Wolf, S.: Teaching Internal Medicine at University of Oklahoma School of Medicine, J. A. M. A. **154**: 408-411 (Jan. 30) 1954.

2. Colmore, J. P., and Wolf, S.: A New Design for Service and Teaching in the Outpatient Department, J. A. M. A. **156**: 830-833 (Oct. 30) 1954.

Aldosteronism.—Aldosterone, the newly discovered normal adrenal secretory product, has attracted the attention of a great many clinical investigators because of its apparent role in the pathogenesis of a number of clinical disorders. This extremely potent sodium-retaining corticoid has been found to be present in excessive amounts in the urine of edematous nephrotics, cardiacs with congestive failure, patients with decompensated hepatic cirrhosis and women with eclampsia. All of these conditions manifest marked edema, but it is obvious that the primary difficulty in each condition is not due to increased activity of a sodium-retaining steroid. It seems reasonable to assume that in the course of the development of each of these conditions a metabolic event occurs which is common to them and which triggers the production of excessive quantities of aldosterone. We would therefore classify such conditions as being associated with secondary aldosteronism. Primary aldosteronism, by which we mean that the disease originates in the adrenal gland, is not associated with edema, and in its pure state manifests itself in the form of an increasing complex of symptoms and a fascinating disturbance of electrolyte metabolism. . . . It would appear to us that the syndrome of primary aldosteronism is now firmly established. It is likely that the condition, which descriptively has been called "potassium-losing nephritis," is a manifestation of primary aldosteronism. A case recently described in England as potassium-losing nephritis is now recognized as one of primary aldosteronism, a large amount of sodium-retaining corticoid having been found in the urine. The major clinical manifestations of this syndrome consist of periodic polydipsia and hypertension. There is no edema. The characteristic biochemical alteration in the blood is comprised of hypokalemia, hypernatremia and alkalosis (elevation of pH and CO_2 combining power). Total serum calcium is normal.—Primary Aldosteronism, A New Clinical Entity, Jerome W. Conn., M.D., and Lawrence H. Louis, Sc.D., *Annals of Internal Medicine*, January, 1956.

STANDARD NOMENCLATURE CODING OF PATHOLOGICAL DIAGNOSIS

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• *The indexing of medical record libraries is greatly simplified if the pathologist affixes a code number representing his diagnosis. The Standard Nomenclature of Diseases and Operations maintains sufficient flexibility for use by most pathologists, and the majority of acceptable pathological thought can thus be represented in a unified, universal code system.*

The majority of surgical specimens received by a department fall into a relatively small list of code classifications. The corresponding code numbers, being frequently used, are soon committed to memory. It is also possible to prepare an abstract of the diagnoses and code numbers most appropriate to the surgical experience of a given institution, so that it is not necessary to go through the entire volume of the Standard Nomenclature for any but unusual cases.

The grateful response of the departmental clerical staff and of the record department personnel has been noted immediately in each institution where this coding system has been introduced.

The increasing use of the Standard Nomenclature of Diseases and Operations has resulted in an increase in requests and "pressure" by record librarians upon pathologists to initiate coding of pathological diagnoses. It is obvious that most trained record librarians can easily code these diagnoses, but they may be hindered by lack of time, lack of adequate clerical assistance, and, at times, lack of familiarity with individual vagaries or idiosyncrasies in the use of "nonstandard" diagnostic terminology. When the morass of histological recapitulation is encountered (e. g., acute appendicitis with suppuration, focal mucosal necrosis, and acute periappendicitis), an impasse frequently results that is not cleared until there is consultation with the pathologist. Such matters become time consuming and annoying to all parties. The record librarian or clerk may consider the pathologist overly pretentious and suffering from a lack of clarity in his thinking, while, on the other hand, the clerk is relegated to the "stupid" category.

The pathologist is apparently reluctant to undertake the coding of his diagnoses. It consumes additional time (true). The nomenclature is thought to be too cumbersome (partially true), inaccurate (individual opinion), or not representative of pathological diagnosis (individual opinion). Moreover, the Standard Nomenclature of Diseases and Operations is usually considered to be a rigid, inflexible system (not true). In order to be uniformly operable, any system must necessarily be relatively restricted. However, the Standard Nomenclature of Diseases and Operations maintains sufficient flexibility to allow for its use by most pathologists, so that it becomes possible to include the majority of acceptable pathological thought in a unified and universal code system. The affixing of the code number by the pathologist making the diagnosis serves an immediate function, since departmental and medical record library indexing becomes a simpler matter. This allows for ease of reference, and, since it does not require experienced clerical help to maintain indexes, releases such personnel for other medical secretarial duties.

Development of System

It is granted that an important element for consideration is time, a commodity in short supply, for the inauguration by the pathology department of use of the Standard Nomenclature of Diseases and Operations requires the expenditure of a certain extra amount of time. While this additional time may seem excessive, it is rapidly and markedly diminished. Constant use of the Standard Nomenclature of Diseases and Operations results in a rapid (and involuntary) memorization of the more commonly used code numbers. It may be discovered, as has been experienced, that the majority of surgical specimens received by the department will fall into a relatively small number of code classifications, perhaps 50 in an average 250-bed general hospital. Within a short time 60 to 70% of these will be committed to memory. Since those memorized will often account for better than 80% of the surgical experience, reference back to the Standard Nomenclature of Diseases and Operations will be required in approximately 20% of cases. Thus, in the majority of instances, coding will become an integral part of indicating the diagnosis, requiring only the additional time necessary to write or dictate the number.

In 1945 I prepared an abstract of the Standard Nomenclature of Diseases and Operations, using those code numbers and diagnoses appropriate to the surgical experience of the institution. In 1952 this abstract was revised to conform with the 4th edition of the Standard Nomenclature of Diseases and Operations. Such an abstract, while time consuming in its preparation, may be considered useful to bridge the gap when training others (professional and clerical) in the use of the Standard Nomenclature of Diseases and Operations. Eventually, this abstract will outlive its usefulness (as per experience gained according to preceding paragraph), so that consideration for preparation of such an abstract must be weighed against its expected period of useful life. The question has been raised by some as to the possibility of actually publishing extended abstracts pertinent to various specialties such as pathology and surgery, particularly where the multiplicity of diagnostic possibilities encountered in that specialty is not restricted to one or more sections of the book as is seen in neurology, where the majority of diseases or conditions are listed in 40 consecutive pages. This would obviate some objections based on the time consumed in going through the large volume in trying to find the appropriate diagnostic code.

One of the major difficulties encountered in the use of the Standard Nomenclature of Diseases and Operations is

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in the designation of a code number for which no equivalent diagnosis is listed. This requires modification of existing codes or derivation of new ones. In all instances the editors of Standard Nomenclature of Diseases and Operations should be notified of such local changes. Perhaps a suitable modification, as yet unpublished, is listed in their files, or the registration of such data may be useful in future compilations of the Standard Nomenclature of Diseases and Operations. Such modification or derivation is often simple, using the topographic and etiological codes, plus the decimal endings. An example is 764-799.8 for cystic adenomatous hyperplasia of the prostate, a variant of the listing 764-799 for benign prostatic hypertrophy. If, after careful consideration, it appears impossible to arrive at a satisfactory code number, the editors of the Standard Nomenclature of Diseases and Operations should be consulted. For example, it was desired to devise a code to separate the normal cyclic variations of the endometrium, which could not be considered as diseases. There was evolved a modification of the existing "no disease" code-000 by the addition of a fourth digit indicating the cyclic phase (785-0001—endometrium, proliferative phase).

Comment

I have had personal experience in this coding system within a pathology department for the last 10 years. In each institution involved in this period, the grateful response of the departmental clerical staff and of the record department personnel has been immediately noted. It is not felt that there is any great inconvenience involved in the use of this system by the professional members of a pathology department. The advantages outweigh any apparent disadvantage (primarily expenditure of time or effort). While there are differences of opinion in diagnostic nomenclature, sometimes at variance with the Standard Nomenclature of Diseases and Operations, such differences are easily reconciled in most instances. Because of the degree of flexibility present in the use of Standard Nomenclature of Diseases and Operations, the individual pathologist is not restricted entirely to the indicated code, except where he differs in his concept of the disease process. The most important consideration is the ease of maintenance of diagnostic indexes, of indexes that do not vary in their systematology among medical institutions.

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ALIEN INTERNS AND RESIDENTS IN THE UNITED STATES, 1955–1956

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and
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• The number of nonimmigrant foreign physicians serving internships and residencies in the United States during the year 1955-1956 was determined by questionnaires sent to hospitals approved for internships and residencies. Of the 6,033 physicians thus located, 1,859 were found to be interns and 4,174 residents. They come from 84 different countries, the largest groups being 1,065 from the Philippine Islands and 584 from Canada. They are distributed among all but four of the states, with 1,535 in New York.

Some 1,700 American students are believed to be attending foreign medical schools. They are distributed among 26 countries, and the largest group is at the University of Bologna.

The status of the foreign-trained physician continues to be of interest to hospital administrators, licensing agencies, medical educators, and the medical profession at large. This report is submitted because of the need of these various groups to have current information to permit intelligent evaluation of trends.

Method of Study

As in last year's report,[1] this survey was designed to eliminate duplication and to avoid the inclusion of foreign-trained physicians who are in this country as immigrants. As in the previous report, the data were collected by the Institute of International Education with the cooperation of the American Medical Association. In September, 1955, an inquiry was sent to all hospitals approved by the American Medical Association for intern or resident training. A follow-up communication was sent in November. Replies were received from 92.9% of the hospitals to which the inquiry was sent. This is a better return than last year and reflects the interest of hospital authorities.

Numbers.—The questionnaire was sent to the 1,329 hospitals listed by the Council on Medical Education and Hospitals as approved for internships or residencies or both. A total of 1,235 replies (764 positive and 471 negative) was received. The total reported represents an increase of nearly 20% over the total of last year.

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Whereas 5,036 alien physicians (including 28 in approved hospitals outside the continental United States) were reported for 1954-1955, there are no less than 6,033 alien physicians in hospitals approved for internship or residency training (including 44 outside the continental United States) in 1955-1956. It is obvious that a great many of the persons who were included in last year's report are still here and are included in this report. There are also many new visitors; approximately 47% of the doctors listed were reported by the hospitals to have begun their hospital training here in 1955-1956. The results show that, of the total reported, 69.2% (4,174) are residents and 30.8% (1,859) are interns; 86.6% (5,226) are men and 13.4% (807), women.

Distribution.—Table 1 indicates that 44 states and the District of Columbia reported the presence of alien house officers and that only 4 states did not report any. These four were Idaho, Nevada, New Mexico, and Wyoming; of these, Idaho, Nevada, and Wyoming have no approved internships or residencies. Thirteen states and the District of Columbia each reported more than 100 aliens as follows: New York, 1,535; Ohio, 485; Pennsylvania, 415; New Jersey, 398; Massachusetts, 371; Illinois, 359; Missouri, 253; Maryland, 229; Michigan, 201; Minnesota, 198; District of Columbia, 167; Texas, 165; California, 138; and Connecticut, 137. This does not differ significantly from the patterns in previous studies. The majority of the states reported an increase over last year, the greatest numerical increases being in New York, Pennsylvania, Minnesota, Ohio, and Maryland.

TABLE 1.—*Alien Physicians Training in Approved Hospitals in the United States, 1955-1956, by States and Territories*

Location of Hospitals	Doctors, Total No.	Location of Hospitals	Doctors, Total No.
Alabama	14	New Hampshire	2
Arizona	30	New Jersey	398
Arkansas	10	New Mexico	..
California	138	New York	1,535
Colorado	71	North Carolina	62
Connecticut	137	North Dakota	3
Delaware	14	Ohio	485
District of Columbia	167	Oklahoma	12
Florida	46	Oregon	20
Georgia	57	Pennsylvania	415
Idaho *	..	Rhode Island	24
Illinois	359	South Carolina	5
Indiana	15	South Dakota	16
Iowa	48	Tennessee	62
Kansas	55	Texas	165
Kentucky	65	Utah	21
Louisiana	23	Vermont	20
Maine	9	Virginia	68
Maryland	229	Washington	31
Massachusetts	371	West Virginia	52
Michigan	201	Wisconsin	75
Minnesota	198	Wyoming *	..
Mississippi	3	Alaska *	..
Missouri	253	Canal Zone	5
Montana	4	Guam	..
Nebraska	1	Hawaii	39
Nevada *	..	Puerto Rico	..
Total			6,033

* No hospitals were polled in these states.

Origin.—These visitors came from 84 different countries as indicated in table 2. Ten countries listed last year do not appear on this list, and there are 11 newly listed countries. Nevertheless, the over-all distribution by country of origin has not changed significantly. Sixteen countries each have more than 100 nationals here, and the six having the largest representation were in the same order as last year: the Philippine Islands, 1,065; Canada, 584; Mexico, 489; Germany, 364; Turkey, 320; and Italy, 260. The greatest numerical increases since last year were seen among nationals of the Philippine Islands, Greece, Turkey, Mexico, Canada, Korea, and Japan.

Fields of Study.—The foreign residents were reported to be in 35 different specialties or fields of study. The 16 most frequent were, in order, general surgery, general medicine, obstetrics and gynecology, pathology, psychiatry, pediatrics, anesthesiology, internal medicine, radiology, orthopedics, otolaryngology, urology, ophthalmology, neurosurgery, pulmonary diseases, and tuberculosis.

Americans Studying Medicine Abroad

In an effort to obtain information about Americans studying abroad, the Institute of International Education sent a questionnaire to 1,000 institutions of higher education throughout the world seeking information about Americans studying in those institutions. One part of the questionnaire was a request to indicate the field of interest of the American scholars abroad. The replies were not complete, but, of 9,439 Americans reported to be studying abroad, 1,730 were reported to have medicine as their field of interest. A few of these 1,730 students in medicine were, undoubtedly, postdoctoral or college-level premedical students. The only sphere of study in which a larger group was reported was the liberal arts. The countries reporting the largest number of Americans studying medicine were Switzerland, Italy, Canada, Netherlands, and Belgium, each with more than 100 American medical students. However, Americans were reported studying medicine in 26 countries. The schools having the largest enrollment of American medical students were University of Bologna, 243; University of Geneva, 215; University of Lausanne, 159; McGill University, 159; University of Leiden, 70; and University of Heidelberg, 54.

TABLE 2.—*Alien Physicians Training in Approved Hospitals in the United States, 1955-1956, by Place of Origin*

Place of Origin	Doctors, Total No.	Place of Origin	Doctors, Total No.
Albania	1	Kenya	1
Argentina	121	Korea	216
Australia	35	Kuwait	1
Austria	54	Lebanon	67
Belgium	23	Liberia	1
Bolivia	6	Lithuania	2
Brazil	97	Luxembourg	5
British Borneo	1	Martinique	1
British Guiana	4	Mexico	489
Burma	3	Netherlands	69
Canada	584	Netherlands West Indies	1
Ceylon	1	New Zealand	6
Chile	8	Nicaragua	25
China	163	Nigeria	1
Colombia	99	Norway	11
Costa Rica	11	Pakistan	10
Cuba	147	Panama	14
Cyprus	14	Paraguay	8
Denmark	3	Peru	89
Dominican Republic	84	Philippine Islands	1,065
Ecuador	33	Poland	6
Egypt	38	Portugal	27
El Salvador	9	Romania	5
Federation of Malaya	1	Ryukyu Islands	1
Finland	4	Saar	2
France	20	South America (undesignated)	2
French Morocco	4	Southern Rhodesia	2
Germany	364	Spain	116
Gibraltar	1	Spanish Morocco	1
Greece	232	Sweden	4
Guatemala	13	Switzerland	60
Haiti	26	Syria	25
Honduras	12	Thailand	47
Iceland	11	Togoland (French)	2
India	208	Trinidad and Tobago	6
Indonesia	3	Turkey	320
Iran	136	Union of South Africa	18
Iraq	36	United Kingdom	110
Ireland	49	Uruguay	1
Israel	38	Venezuela	16
Italy	260	Yugoslavia	5
Jamaica	17	Stateless	4
Japan	190		
Jordan	7		
Total			6,033

Other Professional Visitors

The 1955-1956 surveys of foreign faculty members in the United States and American faculty members abroad, conducted by the Institute of International Education, provide an additional indication of America's drawing

power in the field of medicine. One hundred ninety-two of the 782 foreign scholars and researchers reported are listed under medicine. Of the 1,275 American scholars abroad, only 45 are similarly listed.

Summary

The number of nonimmigrant foreign physicians who are serving internships and residencies in this country during the year 1955-1956 is 6,033. Of this number, 1,859 are interns and 4,174 are residents. They come from 84 different countries in all parts of the world. These visitors are located in all except four states. If Canadian physicians were omitted from the tabulation, the distribution of the remaining 5,449 would not be appreciably altered. The survey questionnaire was worded to exclude alien physicians who are in this country taking graduate courses or engaged in research, immigrant physicians, and Americans who studied medicine abroad. Some 1,700 Americans, including many who were presumably refused admission to American medical schools, are studying medicine outside the United States.

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1. McCormack, J. E., and Feraru, A.: Alien Interns and Residents in the United States, J. A. M. A. **158**: 1357-1360 (Aug. 13) 1955.

CLINICAL NOTES

MAXIMUM BENEFIT FROM THROMBOENDARTERECTOMY

TREATMENT OF COMMON ILIAC ARTERY OCCLUSION, WITH THREE-YEAR FOLLOW-UP

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The recent surgical literature [1] indicates an increasing acceptance of the direct surgical treatment of obstructive arteriosclerosis. As summarized by Longmire [1g] in 1954, the removal of the obstruction and reestablishment of the vascular channel by (1) resection and replacement by a suitable vascular graft or by (2) thromboendarterectomy have both been successful. Which of the two methods is superior awaits further clinical experience. There may be an increasing tendency to reserve homograft replacement for the treatment of aortic aneurysms and possibly femoral arteriosclerotic occlusions and to use thromboendarterectomy for segmental occlusive disease of the lower aorta or the iliac arteries.[2] In arteriosclerosis, the accumulation of cholesterol, fatty acid salts, and tissue debris creates a line of separation between the relatively uninvolved outer coat and the diseased intima of the artery. Gradual narrowing of the arterial lumen by the accumulation often leads to complete occlusion. Thromboendarterectomy is possible because of this pathological cleavage plane within the media.[3]

Proper selection of the patient for thromboendarterectomy may be the major factor in determining a successful result. Localized segmental arterial thrombosis in a relatively young patient is the type of condition that can best be corrected by thromboendarterectomy. Such a patient was treated by this method and now has been followed for over three years. The excellent results obtained for this patient has prompted the following case report as illustrative of the maximum benefit from this procedure.

Report of a Case

A 46-year-old man was first examined on April 1, 1953. His complaint, of eight months' duration, was that of intense pain in the right buttock and thigh after walking 100 to 150 ft. or climbing 8 to 10 steps. It would disappear on two to three minutes' rest. The pain was severe enough to incapacitate him for his work. The patient noted his right foot was much cooler than his left foot. His medical history included only the usual childhood diseases and one short episode of a kidney infection; the inventory of systems and family history were essentially negative. Physical examination revealed a well-developed, muscular man in apparently good health. Blood pressure was 120/80 mm. Hg (both arms). Examination of the right leg demonstrated a markedly reduced femoral artery pulsation at the upper limit of the femoral triangle and questionable popliteal, posterior tibial, and dorsalis pedis pulsations. The left femoral artery pulse was considerably stronger than the right, and the left popliteal, posterior tibial, and dorsalis pedis pulsations were normal. Elevation of the legs above the level of the heart produced unusual pallor of the right foot, showing a marked decrease in arterial flow to the right leg as compared with the left. The retinal arteries showed grade 2 arteriosclerosis; there were no retinal hemorrhages, exudates, or other pathological conditions. The remainder of the physical examination was normal. In addition, the white and red blood cell counts, hemoglobin level, and differential count were normal. Urinalysis and serologic tests for syphilis (Kline and Venereal Disease Research Laboratory) revealed no abnormalities. On April 10, 1953, a preoperative aortogram was done. This is shown in the figure, *A*; it revealed occlusion of the right common iliac artery but fairly good filling of the femoral artery distally, due to well-developed collateral circulation.

TABLE 1.—*Peripheral Pulsations* Before and After Surgery† in Patient with Common Iliac Artery Occlusion*

	Femoral	Posterior Tibial	Dorsalis Pedis
Right (before surgery, 4/10/53).....	1	Questionable	Questionable
Right (after surgery, 4/18/55).....	4	4	4
Left (before and after surgery).....	4	4	4

* On basis of 1 to 4.
† Examination on Nov. 8, 1955, revealed no significant change from these findings.

TABLE 2.—*Oscillometric Index Before and After Surgery* in Patient with Common Iliac Artery Occlusion*

	120	100	80
Right midthigh (before surgery, 4/10/53)....	3/4	3/4	3/4
Right midthigh (after surgery, 4/18/55).....	2½	3	2½
Right midcalf (before surgery).....	2	2	2
Right midcalf (after surgery).....	4½	6½	7
Right ankle (before surgery).....	Trace	Trace	Trace
Right ankle (after surgery).....	3	3½	3½
Left midthigh (before and after surgery)....	2½	4½	2½
Left midcalf (before and after surgery).....	6	8	9
Left ankle (before and after surgery).....	2½	3½	3½

* Examination on Nov. 8, 1955, revealed no significant change from these findings.

Surgery.—Surgery was done on April 28, 1953. The distal aorta and iliac vessels were exposed. A right paramedian incision from the pubis to a level slightly above the umbilicus was used. The cecum was reflected and the distal aorta, common

iliacs, right external iliac, and hypogastric arteries isolated by sharp and blunt dissection. Umbilical tapes were placed around each of these vessels. The distal aorta had a good pulsation, as did the left common iliac artery. On the right, just distal to the bifurcation of the aorta, there was a palpable arteriosclerotic thickening (thrombus), which obliterated pulsation below this point. There was a second palpable thickening at the origin of the right hypogastric artery. Some thickening was palpable throughout the common iliac artery, but the external iliac artery further distally was soft but not distended because little blood, except that from collaterals, entered it.

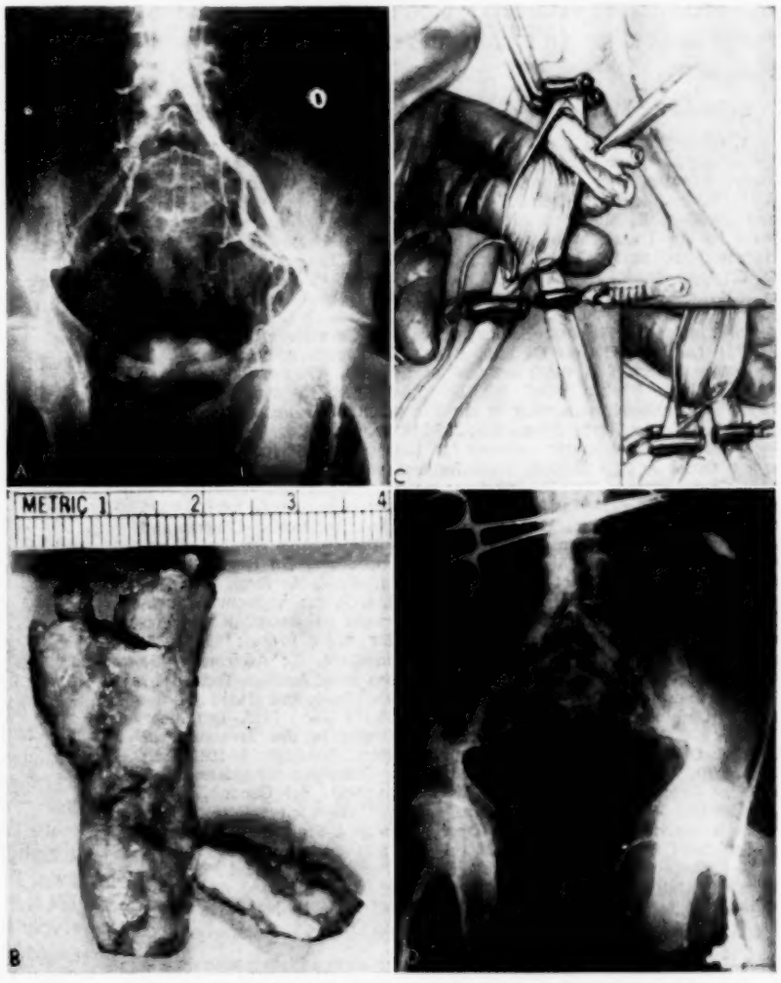
A Blalock clamp was placed in the crotch of the aorta on the right side to occlude the right common iliac artery just at the bifurcation. Endarterectomy was carried out, with dissection of a "cast" of the artery, including a "thumb-sized" thrombus in the proximal common iliac artery (see figure, *B*). Only a shell of the vessel wall was left, which consisted of adventitia and, in most places, a portion of the media. The distal cut edges of the intima were anchored with 00000 silk sutures through the arterial wall (see figure, *C*). An arterial suture of 00000 silk was started at each end of the incised artery and an over-and-over type stitch used to close the artery. At the conclusion of the operative procedure, the right femoral pulsation was equal to the left. (Sympathectomy was not done.)

Course.—This patient was remarkably improved, having a bounding posterior tibial pulse immediately after surgery. This has continued up to the time of writing, now over three years after the operation. Table 1 shows the peripheral pulsations that were palpable prior to surgery and subsequently (on a basis of 1 to 4). Table 2 shows oscillometric readings prior to surgery and subsequently. The figure, *D*, shows an aortogram taken three months after surgery. Four months after surgery, without the permission of his physician, the patient decided to go deer hunting. He was able to walk along mountain trails and to pack a deer on his shoulders down a mountain to camp. He walks nearly a mile to work without discomfort and appears to be maintaining this maximum benefit after endarterectomy.

Comment

Localized obstructive arteriosclerosis in the aortoiliac area in a relatively young patient appears to be the best indication for endarterectomy. This concept would tend to avoid the use of endarterectomy in patients aged 60 and above and in those with so-called diffuse arteriosclerosis. Early diagnosis of thrombotic obliteration of the aortic bifurcation (Leriche's syndrome)[4] when it initially involves only one common iliac artery is a more ideal situation and safer to treat surgically from the point of technique. If reocclusion should occur after endarterectomy, in a previously totally blocked segment, the patient's distal circulation may be no worse, due to well-developed collateral circulation.[1f] Ischemic lesions of the nerves and muscles of the less involved limb with poorly developed collateral circulation have been noted after clamping of the aorta.[11] Therefore, if arterial obliterative disease of one common iliac artery is the cause of the major complaint, with only partial involvement (or stenosis) of the opposite arterial tree, perhaps it is better judgment to attack only the side with major involvement at first and stage the procedure so that a second operation, if found to be necessary on the basis of persisting or progressive symptoms on the opposite side, will be done later.

The advisability of extensive endarterectomy for obstructive femoral arteriosclerosis in contrast to reestablishing the vascular channel by a suitable graft must be evaluated by further follow-up studies,[5] although Cannon and Barker[10] recently reported encouraging results with endarterectomy in selected cases. Distal operative angiography is often essential to determine the patency of the popliteal artery and the system beyond prior to any extensive femoral procedure.[6] In diffuse arteriosclerosis when there is definite risk of distal arterial thrombosis and ultimate loss of limb, it is probably best to settle for lumbar sympathectomy, although it is recognized that this merely warms the feet and improves the color in a favorable case without materially improving the claudication. Lower thoracic and lumbar sympathectomy for obliterative disease of the lower aorta or the iliac arteries has recently been reported as giving satisfactory results during a five-year follow-up period in regard to satisfaction of the patient and warmth of limb (poor as judged by incidence of relief of claudication or improvement of oscillometric findings).[7]



A, preoperative aortogram, showing occlusion of right common iliac artery but fairly good filling of the femoral artery distally, due to well-developed collateral circulation. *B*, posterior view of specimen removed from right common iliac artery and origin of right hypogastric artery. Pathological cleavage plane is well illustrated by this posterior view of the arteriosclerotic process. *C*, surgical procedure. A large collateral lumbar artery is just proximal to the Blalock clamp. Note polyethylene catheter supplying heparin to distal arterial tree. An important step is the anchoring of the distal cut edge of the intima (see insert). *D*, aortogram made three months postoperatively, showing widely patent right common iliac endarterectomized area, with rapid run-off of iodopyracet (Diodrast). Note marked filling of right femoral artery.

Summary

In a case of obstructive arteriosclerosis of the right common iliac artery, treated by thromboendarterectomy, the maximum benefit from this surgical procedure appears to have been achieved. Maintenance of this benefit for a period of over three years suggests that the endarterectomized area will remain widely patent for the duration of the patient's life and that this area will be the least involved by future arteriosclerotic changes in his total vascular system. Selection of patients with localized or segmental arteriosclerosis and well-developed collateral circulation would seem to be the greatest factor in obtaining a maximum result by thromboendarterectomy.

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3. Footnote 1*a* and *e*.

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6. Footnote 1*h* and *o*.

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Cooperation for Better Therapeutic Aids.—It is stimulating to note the freedom with which technical information flows between the scientists in regulatory agencies and the regulated pharmaceutical industries. It is quite common to find these men freely collaborating in the solution of a common problem. This does not mean that industry has gained domination of the agency impowered with its regulation, nor does it indicate that industry has relinquished control of the manufacture of pharmaceuticals to the Government. It does indicate that scientists, in organizations that were once thought to be in opposition, have decided that through cooperation and collaboration they can better reach the common goal, the production of better therapeutic aids for the benefit of mankind.—F. H. Wiley, The Pharmaceutical Chemist and Law Enforcement, *Antibiotics and Chemotherapy*, May, 1956.

BROWN-SÉQUARD SYNDROME WITH BILATERAL ELEPHANTIASIS IN NEUROFIBROMATOSIS

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We recently observed a patient with neurofibromatosis complicated by bilateral upper extremity elephantiasis and a Brown-Séquard type of hemiplegia with ipsilateral diminution of pain and temperature response. Four cases of Brown-Séquard syndrome directly associated with this disease have been reported.[1] To our knowledge, there have been no previously reported cases of bilateral upper extremity elephantiasis in neurofibromatosis. This case, in addition, demonstrates the ability of an apparently long-standing cervical deformity to produce a sudden hemiplegia.

The recognition of "multiple neuromas" as a disease entity preceded Recklinghausen's classical description of neurofibromatosis by 33 years.[2] Bruns described the myriad clinical manifestations of the disease and called attention to the incidence of large distorted limbs.[3] The bone alterations in multiple neurofibromatosis were not fully appreciated until after clinical roentgenology was firmly established. The early work by Gould [4] and the observations of Brooks and Lehman [5] emphasized the almost universal association of bone and structural defects in this disease.

Report of a Case

A 40-year-old white man was admitted to the University Hospital on Jan. 25, 1955. His chief complaint was weakness in the right arm and leg of four months' duration, with onset after a long period of heavy alcohol consumption. The patient had first noticed brown pigmented spots on his extremities and trunk along with thickening and redundancy of the skin over both arms at about 14 years of age. For the past 20 years there had been a progressive increase in pedunculated, soft, cutaneous tumors that were limited largely to the trunk. In 1944, the right upper extremity increased markedly in size following a blow on the upper arm. Previously, he had supported the limb in a sling and with his left hand, but in the past year the left arm had also progressively increased in size and no additional support could now be given. The patient's father showed clinical evidence of neurofibromatosis. No other members of the family were known to have stigmas of the disease.

Physical Examination.—There were massive folds of skin and subcutaneous tissue over both shoulders and upper arms. On the right side, the redundant skin continued down over the forearm and hand. The right arm was 6 in. longer than the left. The skin over both arms had a rough, dark-brown, lichenified appearance, and rubbery, plexiform nodules could be palpated. Soft, pedunculated nontender masses with *café au lait* spots were present over the buttocks and trunk but not on the upper extremities. The neck was short, broad, acutely flexed, and relatively immobile. There was an acute cervical kyphosis and a moderate scoliosis to the left. Function was limited to the wrist and fingers on the right. All the upper extremity joints were voluntarily movable on the left, but the motion in the shoulder was restricted due to the weight of the limb. The right upper limb was spastic and without voluntary movements. The right lower extremity was weak, with a spastic resistance to passive movements. On the left, there was almost complete absence of pain and temperature

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The roentgenograms were reported by Dr. I. Meschan of the Department of Radiology.

sensation from the level of the second thoracic vertebra downward, and, on the right, there was loss of deep tendon and vibratory sensation from the same level downward. The abdominal and cremasteric reflexes were absent bilaterally. The deep tendon reflexes were hyperactive, and the Babinski and Hoffmann reflexes were positive on the right but not on the left. The right pupil was moderately dilated and responded to accommodation movements of the eye but not to light. The optic disks and retinas were not unusual.

A bone survey revealed irregular undulations, with thickening and thinning of the second, third, fourth, and fifth ribs on the left. Both hands and wrists showed irregular contours with erosion that was more marked on the right. Marked extrinsic erosion was seen in the right ulna. There was marked kyphosis and synostosis of the cervical vertebrae, with erosion of the intervertebral foramens and vertebral bodies. The kyphosis made a very acute angle at the level of the fourth, fifth, and sixth cervical vertebrae. The bones of the skull, pelvis, and lower extremities were normal.

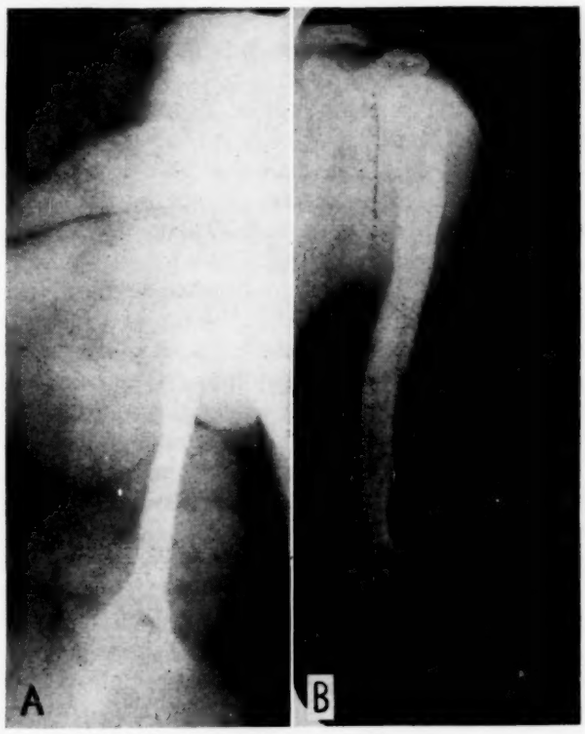

Fig. 1.—Roentgenograms of upper arms showing thickening of soft tissues and irregularity of bones: *A*, right arm; *B*, left arm.

Course in Hospital.—The patient showed emotional lability and refused diagnostic procedures normally taken to determine the level and extent of a spinal cord block. On Feb. 14, 1955, the right upper arm was amputated 4 cm. below the trochanter and the redundant skin and subcutaneous tissue of the shoulder, axilla, and adjacent chest wall was removed to expose the musculature. All the axillary structures could be identified except the large nerves of the upper arm at the line of amputation. The skin defect over the shoulder and the axilla was closed by approximation of the skin edges, and the amputation stump was resurfaced with a posterior skin flap. The operative specimen weighed 57 lb. (25.9 kg.). On March 3, 1955, the redundant skin and subcutaneous tissue over the left shoulder and upper arm were removed by a sleeve-like resection extending from the greater trochanter to the humeral condyles. The resection was carried down to the musculature of the upper arm. The skin defect was closed with a thick-split autogenous graft. The excised specimen weighed 20 lb. (9.1 kg.). The postoperative course was uncomplicated. The patient is now able to use his left arm with ease.

Pathological Anatomy.—The skin and subcutaneous tissue from both specimens were similar. The skin lay in redundant folds with rough, coalescent nodules that resembled the bark of a tree and splotches of dark-brown pigmentation. On section, the subcutaneous layer was replaced by light-gray, granular, rubbery tumor tissue. The muscular bundles appeared atrophic and were disrupted by tumor infiltration. The brachial artery could be identified, but the radial, ulnar, and median nerves could not be identified at the line of amputation. Many distinct tortuous, elongated masses, some up to 6 cm. in diameter, could

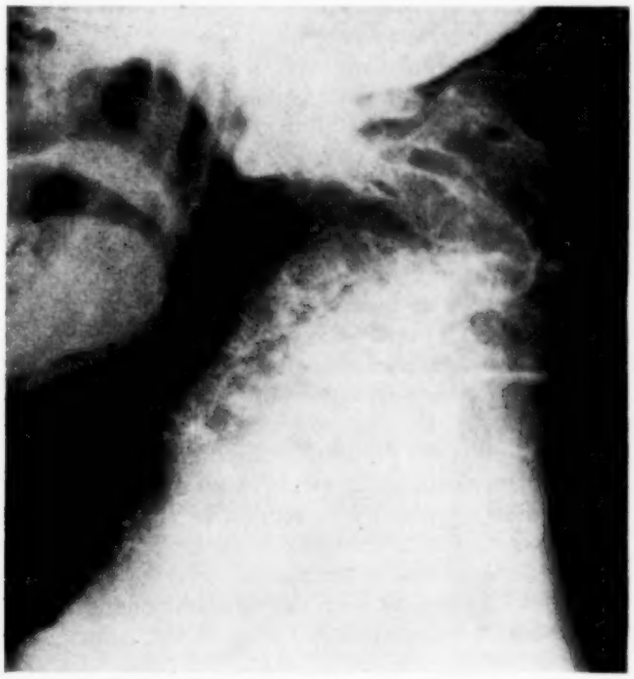

Fig. 2.—Roentgenogram of the cervical vertebrae showing a marked kyphosis with enlargement of the intervertebral foramens.

be palpated within the redundant tissue. The bones were rough and irregular throughout. The elbow could be easily dislocated anteriorly and appeared to be in a persistent state of distraction. The wrist joint was distorted with freely movable carpal bones.

Microscopically, the tumor was composed of moderately cellular whorls of spindle cells with hypertrophied cutaneous nerves. The stroma was in part myxomatous and in part fibrotic. The lymph channels were dilated. The bone surfaces were irregular with evidence of osteolytic and osteoblastic activity. The musculature showed invasion by masses of spindle cells without mitotic activity.

Comment

Neurofibromas have been described in association with neural tissue throughout the body.[6] In elephantiasis, there is marked overgrowth of the neural sheath tissue with disruption of the peripheral nerves and blockage of the venous and lymph channels.[7] In the case reported

Fig. 3.—Amputated right upper extremity.

herein, the marked tumor overgrowth encroached upon the vascular channels so that the lymphatic dilatation could be explained by mechanical blockage. Trauma to the right arm was followed by increased size, as is so often the case in chronic lymphedema. The irregularities in bone length and outline in neurofibromatosis are

probably due to neurofibroma formation in the periosteum, endosteum, and within the Volkmann canals.[8] Aegerter [9] contends the bone lesions represent a fibrous dysplasia and that bowing, collapse, and pseudoarthrosis are due to structural weakness.

Up to 43% of patients with generalized neurofibromatosis have scoliosis and kyphosis. The lower thoracic and cervical vertebrae are commonly involved. A severe gibbus may give symptoms of compression on the spinal cord. Hourglass tumors within the intervertebral foramens may destroy the spinal nerves. X-ray examination will usually demonstrate the presence of enlarged intervertebral foramens. Hourglass lesions are usually unilateral and involve only a few segmental nerves. A gibbus deformity usually develops slowly, but there may be a history of sudden exacerbation of symptoms. Hemiplegia and paraplegia are common only in a gibbus type of transverse myelitis. In 20 cases of paraplegia with neurofibromatosis, 60% were due to extreme gibbus deformity.[10] Usually both neurofibroma and acute flexion deformity are present. In two of the four reported cases of Brown-Séquard syndrome,[1] the patient was relieved of symptoms by correction of a herniation of the nucleus pulposa at the point of the flexion deformity. This would suggest that the sudden onset of symptoms in this case might have been due to a sudden herniation of the nucleus pulposa in the area of the deformity.[11]

Summary and Conclusions

Multiple neurofibromatosis is a progressive disease with episodes of exacerbation and remission. The patients are acutely aware of their disease and tend to be emotionally unstable. Surgery should be limited to complications. Trauma and surgery may actually increase the incidence of complications. In the case reported herein, the right arm was amputated because it was functionally useless and its weight a hindrance to the patient. Removal of the redundant tissue from the left arm greatly enhanced its motility. Surgical exploration for herniation of the nucleus pulposa and neurofibroma in the cervical vertebra was probably indicated.

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SPECIAL ARTICLE

THE SIX UNITIES IN MEDICAL RESEARCH

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The medical practitioner, alert to opportunities for trial of new remedies and procedures, occasionally can add to the knowledge in his field by reporting to his colleagues his success with some new therapeutic measure. In making such a report and, indeed, in planning the study that led to it, the author needs to have command of the "principles of experimental method." These principles are not a series of numbered statements but a body of knowledge made up of logic and arithmetic and dealing with the design of experiments and the evaluation of the experimental data from them.

The present discussion will be devoted to the logic alone, as the arithmetic can be found in any textbook on statistical methods. The discussion will deal with one rule from among the principles of experimental method and with applications of the rule in actual experimental situations. The rule is directed toward prevention of errors, or at any rate reduction in their number, in the design of an experiment. It may be phrased, "See to it that your data are comparable." I shall prefer to elaborate this statement somewhat into: "Observe the six unities—unity of time, place, material, procedure, personnel, and mental attitude." It may be admitted at the start that it is sometimes impossible and sometimes inconsistent with medical ethics to observe all six of the unities. One or more may have to be violated in an experimental study. The logical penalty is the same, however, whether the violation is from carelessness or necessity. Observance of the six unities is necessary for correct experiment design. Violation of one or more may make it impossible to draw a firm conclusion.

The Experiment

The rule, "observe the six unities," applies to any therapeutic trial of a new treatment as against an old, and to any other experiment. Simply defined, an experiment is a test of the effect of something on something else. From another point of view, an experiment is a test of the relevancy of a condition of measurement. With the understanding that no deep philosophical connotation regarding causality is implied, an experiment may also be defined as a test for the presence of a causal relationship between two variables, or, as the mathematician would put it, a test to determine whether one of the two variables is in any sense a "function" of the other. The term "experiment" has sometimes been used with a broader meaning, e. g., to cover the operations leading up to making a single measurement, but this usage is outside the limits of this discussion.

If in some instance an investigator sought to test the effect of change in body temperature on heart rate, or the effect of epinephrine on blood pressure, or the possible

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superiority of tetracycline over penicillin in some type of infection, he would be doing an experiment. In the heart rate experiment, as an example, he would make several or many measurements of heart rate at one imposed body temperature and several or many at some other and compare the two sets of measured values. If there was a significant difference, he would undertake to reach some conclusion as to the cause of the difference and would be justified in ascribing it to the difference in temperature if he had observed the six unities in carrying out the investigation. (Attached to this conclusion is an important reservation and an important qualification that can be listed but not discussed here: The reservation is that the conclusion may be erroneous—the result of the experiment, even if extreme, may nevertheless be a chance observation and not consistently reproducible. The qualification is that the conclusion is nontransferable—it applies only to the prevailing conditions of measurement until shown by other work to have a broader application.)

More complicated experiments exist: heart rate could be measured at each of a succession of temperatures instead of just two, and a curve (a "regression" curve) could be plotted to display the findings; the effect of temperature on several variables could be investigated simultaneously, heart rate being just one of the several, or a test could be made for the effects (if any) on heart rate when a change was made in each of several variables (a "factorial" experiment). The existence of more complicated experiments in no way invalidates the typical simple experiment (simple comparison) just given.

It will be noted that there are two variables in the heart rate experiment, body temperature and heart rate. Every simple experiment has two variables. The first of the pair is suspected of being causally related to the second, in the sense that a change in the value of the first, it is believed, may possibly bring with it a change in the value of the second. The term "therapeutic agent" is so commonly applied to anything brought to bear upon a patient to make a change in his condition that I shall borrow the term "agent" and apply it to the first variable in the pair—the one whose change in value is suspected of possibly having an effect on the other. It will be called the agent variable and will be designated by the letter "A"; the second variable, possibly affected by a change in the first, will be called the affected variable (called also the "response" variable) and designated by the letter "X."

The structure of an experiment may now be redescribed: A simple experiment consists of establishing for an agent variable any chosen value (call it A_1) and making several or many measurements of an affected variable to yield a group of X_1 values, and in establishing for the agent variable some other value (A_2) and making several or many measurements of the affected variable to yield a group of X_2 values. The X_1 and X_2 values are then compared (assuming that they are comparable) for any significant difference that may be found between them, and, if a significant difference is found, a conclusion is sought as to the cause of the difference. The question just raised as to the comparableness of the two groups is settled in advance if the rule of thumb about the six unities has been followed.

The Six Unities

Every scientific observation—measurement of the heart rate or blood pressure of a patient or a laboratory animal, observation of a death or a recovery as the outcome in a case of pneumonia—is beset with an unlimited number of "conditions of measurement." The time of day, time in the year (i. e., the date); place where the observation was made, place where the patient had been; the material on which the measurement was made (e. g., white adult male, age 38, Swedish origin, weight 160 lb.; or perhaps it was a white rat, Wistar strain); procedures leading up to the measurement; person or persons involved in making it, mental attitude of the measurer and of the person (or rat!) measured (e. g., unsuccessfully suppressed hope that the measured value will not turn out to be high, or alternatively, not turn out to be low)—these and countless associated details surround and beset the making of any measurement or observation.

Each of these conditions of measurement is capable of change between one measurement of X and the next and represents, therefore, a value of another variable. The pair of variables, A and X, that are featured in an experiment are, therefore, the center of a countless cluster of additional variables, each of which might be suspected of being related to X just as truly as A is so suspected. If one is to be able to come to any conclusion regarding the relation of A to X, it is necessary that these other variables not interfere. If one happens to be the first to run a test of the effect of imposed change in body temperature (A) on heart rate (X), one must be sure that when body temperature is changed (from A_1 to A_2) there is no associated and consistent change in, say, the amount of anxiety felt by the subject on whom the measurements are made. So far as one is able, one must see to it that for this variable and for each of the many other variables surrounding the experiment the average and range of the variable is the same or nearly the same for the X_1 group of values as it is for the X_2 group. Exactly what is meant by this requirement, which is simply an alternative phrasing of "observe the six unities," will be clearer as the discussion goes along.

Unity of Time.—There must be identity or near identity between the average and range of time prevailing for the X_1 group of values and the average and range of time prevailing for the X_2 group of values. In comparing two sulfonamides in a respiratory epidemic in camp, unity of time demands that both kinds of treatment be in progress concurrently. If the time range for treatment with sulfathiazole was six weeks, the time range for sulfadiazine must also be six weeks or close to it. The mean or average date must also be the same or nearly the same. The latter requirement makes it necessary that the two treatments be tested concurrently. If sulfathiazole were used in the first six weeks and sulfadiazine were then used on to the end of the epidemic, a trend in the virulence of the disease might alone account for any difference observed between the results of the two treatments.

If a new mode of treatment for congestive heart failure is to be tested for comparison with an older treatment, unity of time requires that both treatments be tested concurrently from the start. Tossing a coin for each succes-

sive patient, as he comes to the doctor, will decide which treatment (A_1 or A_2) he is to receive. If the investigator should, instead, give the new therapy to all patients who come and compare the results with those of collected cases from his earlier practice or from the literature, when he comes to draw his conclusions he will be plagued by the possibility that some trend, acting in the time period between the X_1 and X_2 observations, was the cause of his results.

The "before and after" type of experiment, if pairs of measurements are always made in a fixed sequence (as X_1 always first and X_2 second) is affected by lack of unity of time. The term "before and after" characterizes an experiment in which one piece of material—one person, one rat—furnishes both an X_1 and an X_2 value. Typical is an experiment to determine if a new drug lowers (or perhaps raises, or has no effect on) blood pressure. The subject's blood pressure is measured to get an X_1 value, the drug is administered, and then after a suitable waiting period his blood pressure is measured again to get an X_2 value. The investigator then moves on to another subject and collects another pair of values, and to others for other pairs.

The "before and after" experiment lacks unity of time if all measurements are made in the same sequence, as always X_1 followed by X_2. If the time sequence can be reversed in approximately half of the pairs of values, becoming X_2X_1 instead of X_1X_2, the "before and after" experiment can be made free from the error in design. In some "before and after" experiments it is impossible to reverse the sequence of the measurements. An example is an experiment to compare heart function before (X_1) and after (X_2) thyroidectomy in cases of cardiac insufficiency. In such cases the investigator thinks of a concurrent sham experiment—a control experiment in which no change is made in the agent variable (e. g., a sham thyroidectomy, with no change in thyroid function). In laboratory experimentation, control experiments present no problem. In the thyroidectomy experiment a sham operation on the thyroid would be unthinkable. Medical ethics is frequently a block to observance of one of the unities in clinical investigation.

If an experiment unavoidably lacks unity of time, it may be possible to compensate for the error, provided that the two time ranges are not completely separated but are instead concurrent over part of their course. The two groups of values (or other "results") are examined for any trend in the values along the time range within either group. If the earlier versus later measured values within each group show no tendency to either rise or fall but follow a horizontal time course, it may be believed that the difference observed between the results of the two modes of therapy (A_1 and A_2) has not arisen from the lack of unity of time. (It might still be attributed, however, to violation of some other unity.)

Unity of Place.—There must be identity or near identity between the average and range of place prevailing for the X_1 group of values and the average and range of place prevailing for the X_2 group of values. The range of place, like that of time, may be as extensive as is necessary for the purposes of the experiment. An investigator might, in some experiment, roam throughout the whole country in the course of his study and make one or more measurements at every stop.

If the roaming investigator made a pair of measurements at every stop, one an X_1 and the other an X_2 measurement, he would be performing what is called a "paired" experiment—paired on the basis of place. Measurements may be paired on the basis of any important condition of measurement. In the present case, if he were engaged in a paired experiment, the investigator would toss a coin before making a pair of measurements to determine which—an X_1 or an X_2—to make first. If it were not a paired experiment, he would still let chance decide, for each measurement, whether it was to be an X_1 or an X_2 measurement.

If an experiment is confined to a single city, the X_1 subjects must not be drawn from the river section and the X_2 group from the hill section of town. A difference in locality can affect the outcome. If the experiment is conducted in a hospital, the X_1 and X_2 groups must not come from different wards. If rats are the subjects of study instead of patients, there must be no constant difference in position between X_1 and X_2 cages in the animal room. A difference in location may bring with it a difference in illumination, or temperature, or disturbance from passing personnel—all conceivably capable of affecting the outcome of the experiment. It will be seen that Dr. X cannot compare the results of his treatment of patients with pneumonia with those of Dr. Y in a different city without taking into account the lack of unity of place when he essays to draw conclusions from the comparison.

Unity of Material.—There must be identity or near identity between the average and range of any given characteristic of the material (the subjects) measured in the X_1 group and the average and range of the same characteristic for the X_2 group. Unity of material is achieved with the greatest economy of effort if the measurements can be paired on the basis of material. If a number of pairs of identical twins were available, one twin for an X_1 observation and the other for an X_2 observation, only a few pairs of measurements would be required to arrive at unity of material as between the two groups. More measurements would have to be made if the twins were not identical, more still if the two persons in each pair were merely of the same race, or same weight, or same sex, or had other sameness.

Giving treatment A_1 to a patient with a certain severity of a given disease and giving treatment A_2 to another, selected because he has the same severity of the disease, is an example of pairing on the basis of material. It is usually not practicable to do this, however.

The alternative to pairing has not as yet been named; it is called "group comparison." In an experiment in which two treatments, A_1 and A_2, are tested on patients with cardiac insufficiency, pairing might well be impracticable. The doctor would instead toss a coin for each patient who came to him to decide which treatment, A_1 or A_2, the patient was to receive.

There are many details of the material used in an experiment, each of which would call for identity in average and range as between the X_1 and X_2 groups of values,

if such unity were practicable to achieve. It is not; yet over-all unity of material, particularly if measurements are paired on the basis of some very important characteristic (e. g., severity of illness), would seem to be attainable, if a sufficiently large number of measurements is made. This expectation is based on the probability that, when a large number of errors exists, all will not be of the same sign but will instead tend to cancel out. If a large number of minor violations of unity of material exists, some tending to increase the difference between the X_1 and X_2 group of values and some tending to decrease the difference, they are expected to more or less balance one another.

The procedure of tossing a coin as each piece of material presents itself in order to decide which treatment, A_1 or A_2, it shall be given may be expected, as has been said, to lead to over-all unity of material, provided that a sufficiently large number of measurements is made. This procedure—or the modification of it followed in the case of the paired experiment—is known as random selection. It will be noted that random selection leads to unity of time and place as well as unity of material. The three are obviously related. If either unity of time or place is violated, as by collecting the X_1 values in one year and the X_2 values in a subsequent year or in a different city, unity of material can never be assured. On the other hand, the roaming investigator who made one or two measurements at every stop in a trip around the world could expect to end up with two groups of values affected by the same or nearly the same over-all average and range of material. All that would be necessary would be that he select the cases for the X_1 group and the X_2 group by random selection. It will be noted that the "before and after" experiment, previously referred to, is one that is paired on the basis of material.

If the investigator has found himself unable to build into his experiment the desired unity of material, he may examine each group of measured values for any trend in the values that may appear when they are arranged in order of increasing age or weight or other detail of material. If no trend is found, it may be believed that, in spite of the lack of unity of material in respect to age or other detail, the error in design has not affected the outcome of the experiment. This judgment is valid if the two ranges of age or other detail under consideration overlap, as they ordinarily may be expected to do.

Unity of Procedure.—There must be identity or near identity between the average and range of procedures affecting the X_1 group and the average and range of procedures affecting the X_2 group of values. The difference in procedure that constitutes the essential difference in the two methods of therapy, A_1 and A_2, is of course excepted. (The tacit assumption has been made so far that the change in the agent variable from its A_1 to its A_2 value is one involving a difference in procedure. This is usually the case in medical research, but it need not be. The change whose effect is sought may be one of place, or material, or even time.)

In a study to determine the effect, if any, of a new drug on blood pressure, unity of procedure demands that a placebo (A_1) be given prior to the X_1 measurement as the counterpart of the actual dose (A_2) that precedes the X_2 measurement. Administration of the placebo can easily be made to resemble in every respect the administration of the actual dose (A_2). If the study is one to establish the comparative merits of a high choline intake (A_2) versus an ordinary choline intake (A_1) in cases of cirrhosis of the liver, there will be little difficulty in giving the same average and range of diet in the two groups of patients (X_1 and X_2), instituting the same hospital care and prescribing the same average and range of activity, with the addition of placebo capsules for the X_1 patients to match the choline capsules given the X_2 patients. Unity of procedure would be assured if the collection of cases in the two groups were continued long enough.

Unity of procedure is blocked by considerations of medical ethics in many clinical investigations. In an experiment to evaluate the results of thyroidectomy in cases of cardiac insufficiency, unity of procedure is out of the question. The study may establish that something in the complex of procedures involved in the thyroidectomy and hospitalization has improved the condition of the patients, but to identify the stoppage of thyroid function as the single effective element in the complex, from the evidence furnished by the experiment alone and without use of collateral evidence, would require that a sham thyroidectomy be performed on approximately every other patient, for comparison with the real removal of the gland. The same difficulty would exist in a study to determine the effect of section of the vagus nerves on gastric hypersecretion of acid in cases of gastric ulcer. The fasting gastric secretion (X_2) after such an operation might be significantly less than before (X_1), but a sham vagotomy would have to be performed on approximately every other patient for comparison with the real vagotomy to permit a firm conclusion, from the experimental evidence alone, as to just what element in the total complex of procedures was the cause of the result.

The "before and after" experiment offers a peculiar difficulty in achieving unity of procedure. In an experiment to test the effect of a new drug on blood pressure, the X_2 measurement on a given subject is the end of a train of events that includes making the X_1 measurement. The X_1 measurement is in effect a rehearsal for the X_2 measurement, but the X_1 measurement, itself, does not have the benefit of any prior rehearsal. Such a difference in procedure—rehearsal for all X_2 measurements and none for the X_1 measurements—is itself capable of bringing about a difference between the two measured values in a pair. A comparable difficulty in regard to unity of time was solved by either reversing the sequence of the measurements within the pair in approximately every other pair or by running a concurrent sham experiment. Unity of procedure is also achieved in this type of experiment by one or another of these two alterations in the design. Reversal of sequence—making the X_2 measurement first and then making the X_1 measurement—is not possible in an experiment in which application of the therapeutic agent makes a permanent change in the material.

There is a common misconception that diversity of procedure within the X_1 group and within the X_2 group impairs the comparability of the data. If the camp doctor

in the respiratory epidemic previously mentioned were to give varying dosages of sulfathiazole (A_1) and of sulfadiazine (A_2), at varying intervals, in varying preparations (powder, solution, tablets), by varying routes, sometimes associated with meals and sometimes between meals, sometimes with sodium bicarbonate and a hot drink, sometimes without sodium bicarbonate but with a cold drink, there would still be unity of procedure provided that the average and range of procedures for the X_1 group of observations and the average and range of procedures for the X_2 group turned out to be the same or nearly the same. The doctor is at liberty to exercise his best judgment in all cases, if he can collect a large enough series of cases.

Unity of Personnel.—There must be identity in the personnel connected with the X_1 measurements and the personnel connected with the X_2 measurements. In the study of the two sulfonamide compounds in the respiratory epidemic in camp, the patients under the two treatments must not be separated into different hospitals or different wards with different nurses, doctors, or attendants, or even cooks. Any one nurse must take care of approximately the same number of X_1 and X_2 patients, the same chef must preside over the preparation of their food, each doctor must take care of approximately equal numbers of X_1 and X_2 patients, and the same even division of attention must extend to laboratory technicians, x-ray personnel, and others.

The requirement as stated covers any practical situation. Let it be supposed, however, that in some elite camp every man had his own private physician, nurse, and cook. A comparative study of the two sulfonamides could still be carried out under these conditions, even though there would be no actual identity in personnel. If the number of patients was large enough to assure unity of material, the number of doctors would also be large enough for unity between the X_1 and X_2 groups of doctors—the same average and range of skill and temperament—and there would be a like unity for the nurses and for the cooks.

Lack of unity of personnel is one of the least likely to arise in an experiment. The need for such unity should not be forgotten, however, when Dr. X attempts to compare his results, using one treatment, with those of Dr. Y, who has used another. The difference in doctors, rather than the difference in treatments, may be the cause of the result.

Unity of Mental Attitude.—The final unity has to do with the mental attitude—it may be called the personal bias—both of the personnel involved in an experiment and of the animate subject material on which the measurements are made, be it patients or laboratory animals. There must be identity or near identity in the average and range of mental attitude prevailing for the X_1 group of measurements and the average and range of mental attitude prevailing for the X_2 group. One is not required to make a psychiatric examination of doctors and patients to assure this identity; one need only to make sure that the experiment is so designed that a difference in mental attitude as between the X_1 and X_2 measurements could not arise.

For unity of mental attitude in the patients subjected to a therapeutic test, neither group, X_1 nor X_2, should be aware that there is an older accepted treatment and a newer treatment as yet untried. If knowledge of the existence of two treatments is unavoidably current in the two groups, no patient should have reason to doubt that he is getting the treatment best suited to his case. If the test is a pharmacological one, in which some drug is given for possible effect on a body function, the X_1 group should be given a placebo preparation—tablet, colored liquid, or hypodermic injection as the case may be—as nearly identical with the drug in appearance and administration as possible. This is required for unity of procedure and, clearly, also for unity of mental attitude.

It will be seen that unity of mental attitude between two groups of subjects cannot be achieved if there is violation of unity of personnel. If Dr. X should have charge of one group and Dr. Y have charge of the other, a difference in the personalities of the two men may conceivably affect the mental attitude of the two groups and through it affect the outcome of the study. The doctor must also have the same mental attitude toward the X_1 and the X_2 groups of measurements. To achieve it, he must not know which treatment each patient is receiving, A_1 or A_2, until measurement has been completed on the patient. It is seldom possible to meet this requirement. The study of the two sulfonamide compounds in an epidemic in camp happens to be one in which unity of mental attitude could easily be achieved. The two compounds could be prepared in identical tablet form, each with a code name or indeed several code names, and the key to the code could be known only to the dispensing pharmacist, or the manufacturer, until the study was over.

Medical ethics may stand in the way of administration of placebo therapy. The block may be removed, however, by frank talk with the patient in a situation in which use of the placebo would not endanger the patient's welfare. In a test to determine if the administration of testosterone has any effect on the frequency and severity of attacks of pain in cases of angina pectoris, the doctor could explain to each patient that during an unidentified portion of the time, in the next several months, he would give injections of a new drug and during another portion of the time he would have to inject only the solvent solution, without the drug. This course would be necessary in order to make any proper evaluation of the results of the treatment and possibly save needless continuation of an expensive series of injections, if the drug should prove to be of no avail. He would make no charge for the injections, as the manufacturer was furnishing him the material without cost, and would charge only for the necessary routine visits for checkup and for adjunct therapy (e. g., digitalis if cardiac failure is present, supervised limitation of activity, and glyceryl trinitrate and spiritus frumenti when an attack is in progress). The identity of preparation "X" and preparation "Y," one of them being the testosterone and the other the placebo, would be known only to the manufacturer until the study was completed. In other

studies it may be possible for the doctor to have a colleague evaluate the results of the two treatments. If, for example, the results are observable by x-ray or by some laboratory measurement, the x-ray consultant or laboratory director may complete his evaluation of each patient before knowing what therapy each has received.

In summary, it may be said that the best way to assure unity of mental attitude is to make sure that all persons whose mental attitude may be capable of affecting the X_1 and X_2 measurements are deliberately kept uninformed as to the difference in therapy until the measurements are completed. This is often difficult or even impossible to do. Unity of mental attitude is, accordingly, the one of the six that is violated most frequently in experimental investigations.

What if a Unity is Violated?

Up to this point in the analysis of a piece of work reported in a journal (or examination of the proposed steps in an experiment the investigator may plan to do) the operation has been almost mechanical. It involves reading the paper with a check list of the six unities at hand and merely placing a check mark or a cross or a question mark opposite each of the six items. At this point, however, expert judgment in the field of the experiment may have to enter into the operation. If one of the unities is violated, a question is uncovered that could have been answered factually if the experiment had been better designed but now must be answered, as best it can, by the judgment of the onlooker—author or reader—alone.

Did bias on the part of the patient with angina pectoris contribute to or even cause the improvement in well-being during the treatment with testosterone? The therapeutic test did not have unity of mental attitude. Did hospital care, or mere exposure and manual disturbance of the abdominal viscera contribute to or actually bring about the lowering of gastric acid secretion in the patients with gastric hyperacidity treated by cutting the vagus nerves? The experiment lacked unity of time, procedure, and mental attitude. Questions such as these should not be left over to be cleaned up at the end of an experiment, but if left they are, by a perhaps unavoidable violation of some one of the unities, the author owes it to the reader to give them his best attention. When writing the report of his study, the investigator will do well to "remember the six unities." Each demands attention in his discussion, and the reader is entitled to the author's own evaluation of each.

Summary

Every measurement or observation made in a therapeutic or pharmacological test or other experiment is made in the presence of an unlimited number of "conditions of measurement." Many of these are capable of affecting the result of the experiment if they are not held constant as between the two groups of observations or measurements that are made. They can be held (approximately) constant by "observing the six unities"—unity of time, place, material, procedure, personnel, and mental attitude.

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COUNCIL ON PHARMACY AND CHEMISTRY

Report to the Council

The Council has authorized publication of the following report.

H. D. KAUTZ, M.D., *Secretary.*

CURRENT STATUS OF THE DRUG THERAPY OF EPILEPTIC SEIZURES

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Considerable progress has been made in the past two decades in both diagnosis and treatment of epilepsy. The techniques of electroencephalography, pneumoencephalography, and angiography have made it possible to verify specific seizure types and to uncover pathological processes previously not diagnosed except at operation or autopsy. The development of more efficient drugs now makes it possible to control or greatly reduce the frequency of seizures in more than 75% of the patients and thus allow them to lead a normal life. Previously held notions as to intelligence and personality characteristics of patients with seizures have been discarded, and many of the restrictions, both social and economic, have been shown to be unjustifiable. Nevertheless, many erroneous impressions are prevalent among the laity and medical profession concerning "epileptics," and they are still not fully accepted by society. Though this report concerns itself with the technique of drug therapy, it is important that the physician apprise himself of the broader aspects of the problem.

The term epilepsy does not refer to a disease entity but rather to a symptom-complex. It is characterized by periodic, transient episodes of alteration in the state of consciousness, which may be associated with convulsive movements and/or disturbances in feeling or behavior. As implied in the definition, a wide variety of clinical manifestations come under the heading of epilepsy. There is also a long list of conditions and diseases of the nervous system and seemingly unrelated structures in which convulsive phenomena are prominent. Before beginning treatment, it is important to define properly the type of seizure and if possible to detect the underlying disease process. Since convulsive seizures may precede other symptoms of disorders of the nervous system by many years, constant reevaluations are necessary.

Classification of Seizures

It is customary to describe seizures in terms of the associated disease process as well as the type of seizure. When a structural defect or physiological disturbance of the brain can be demonstrated, the convulsive disorder

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is described as symptomatic or acquired; when such factors are not found, the disease is called idiopathic or, more justifiably, a seizure of unknown origin. The more thoroughly the history and condition of the patient are probed, the fewer are the cases that are classified as idiopathic.

The clinical manifestations that occur during a seizure are not dependent on the nature of the pathological process responsible for the attacks but are related to the site of origin of the abnormal discharge that initiates the seizure and to the rapidity and extent of the spread of this discharge. The symptoms that occur during a seizure are so numerous and varied that it is impossible to set up a simple classification that will include all cases. It is customary, however, to divide them into four groups: grand mal, focal, psychomotor, and petit mal. Some investigators construct a classification based on the presumed site of origin of the abnormal discharge; however, the therapeutic effectiveness of available anticonvulsant drugs is so intimately correlated with seizure types that this division will be used here.

Grand Mal.—Grand mal seizures occur with or without aura and are characterized by sudden loss of consciousness followed by generalized tonic and clonic spasms of the musculature. Tongue biting as well as urinary and fecal incontinence may occur. Typical postseizure phenomena are headache, sleep, confusion, and exhaustion. The frequency and severity of these attacks are highly variable. Abortive forms consisting of the aura itself, a brief lapse of consciousness, or precipitous falling are frequently encountered. These minor episodes must be differentiated from petit mal attacks.

Focal Seizures.—Focal seizures have some clinical manifestation that indicates that their site of origin is in the cerebrum. The classical example of a focal attack is the so-called Jacksonian seizure, which is characterized by convulsive twitching of isolated muscle groups. If the convulsive movements remain limited, consciousness will be maintained; but with progression of convulsive movement from one part of the body to another, loss of consciousness may occur. Focal seizures are usually associated with a gross organic lesion of the cerebral cortex, which may or may not be demonstrable by clinical techniques now available.

Psychomotor Seizures. — Psychomotor attacks are characterized by automatic patterned movements, with clouding of consciousness and postictal amnesia for the episode. The movements may be as simple and brief as slapping the hands, or episodes of sequential behavior lasting 2 or 3 minutes may occur. Because these attacks are manifested by alterations in behavior, perception, and affect, they are frequently confused with hysterical and psychotic symptomatology.

Petit Mal.—A typical petit mal attack is characterized by a sudden brief lapse in consciousness with minor motor movements of the head, eyes, or extremities. The seizure lasts 5 to 30 seconds, after which the patient is immediately alert and able to continue his usual activity. Akinetic seizures, taking the form of sudden toneless episodes with falling, and myoclonic jerks, which are sudden involuntary muscular contractions of the trunk or limbs, are usually included with petit mal because of the similarity of their electroencephalographic patterns; however, both of these may be phenomena of the grand mal attack as well. Their relative refractoriness to those drugs effective in pure petit mal makes it doubtful whether they should be included in this category. Petit mal is further characterized by its high incidence in childhood, the frequency of the seizures (many per day), and the rarity of their occurrence in association with gross brain lesions.

General Principles of Drug Treatment

The objective of all anticonvulsant therapy is to establish and maintain a reservoir of drug sufficient to control the seizures while producing a minimum of side-reaction. The ideal anticonvulsant, one that would affect all seizure types, have an established dosage, and produce no untoward effect, is as yet unavailable. Consequently, choice must be made from a group of drugs one or more of which is most effective for a particular seizure type or for a particular patient. If more than one seizure type exists, a combination of drugs is usually more effective than a single one. In fact, a combination of drugs will often be necessary even for patients with a single seizure type. The choice of drug must also be governed by its ease of administration and its safety in regard to nonfatal and reversible toxic phenomena.

After choice of the most effective drug or drugs for a particular patient has been made, it must be remembered that anticonvulsants have no fixed dosage. Their administration should be started at what is assumed to be a minimum dose and gradually increased until either the seizures are controlled or toxic reactions to the drug develop. If the latter occurs without seizure control, the administration of drug is not discontinued but doses are reduced to a nontoxic level and a second drug is given following the same principle of increasing dosage. This system of pyramiding drug administration allows for the establishment of a reservoir of two or more anticonvulsants, the combined action of which is more effective than any one drug by itself. As many as three or four drugs can be combined in this fashion without producing toxic reactions. Frequent shifting of drugs is undesirable. When new drugs are introduced, previous medication should not be discontinued until an optimum level has been established for the new medicament.

Diligence and patience are necessary to find by this method of trial and error the best possible combination of drugs and the optimum dosage schedule for each individual patient. The patient's confidence and cooperation are essential for the success of a program of this sort. He must be indoctrinated in the mechanism of the process and enlisted to play an active role in keeping accurate records of his seizures, taking prescribed doses, and reporting his reactions to the drug.

The antiepileptic drugs most commonly used are derivatives of the barbiturates, hydantoins, oxazolidines, bromides, and, to a lesser extent, the phenylacetylureas, succinimides, and carbonic anhydrase inhibitors.

The following is a list of currently employed drugs and combinations designated under nonproprietary terminology that are commercially available under various trade names:

Barbituric Acid Derivatives.—Phenobarbital, mephobarbital, metharbital, and primidone.

Hydantoin Derivatives.—Diphenylhydantoin sodium and methylphenylethylhydantoin (3-methyl-5,5-phenylethylhydantoin).

Oxazolidine Derivatives.—Trimethadione and paramethadione.

Phenylacetylurea Derivative.—Phenacemide.

Succinimide Derivative.—Phensuximide.

Carbonic Anhydrase Inhibitor.—Acetazolamide.

Combinations of Two or More Drugs.—Diphenylhydantoin sodium, phenobarbital, and methamphetamine hydrochloride; diphenylhydantoin and mephobarbital; diphenylhydantoin and phenobarbital; methylphenylethylhydantoin and phenobarbital.

Techniques of Drug Administration in Major Seizures (Grand Mal, Focal, Psychomotor)

Initial Drugs of Choice.—For all types of seizures, except petit mal, initial drugs of choice are diphenylhydantoin sodium and/or phenobarbital. These drugs have been shown to have a high therapeutic index with a minimum of untoward side-effects and are commonly regarded as standard anticonvulsant drugs. When toxic reactions to these drugs do occur, they are rarely serious and are reversible when administration of the drugs is discontinued or dosage adjusted. In patients with infrequent seizures (less than one a year), phenobarbital may prove effective by itself and, in such instances, usually is the drug of choice. In patients with more frequent attacks, diphenylhydantoin sodium usually is preferred as the initial drug, with phenobarbital added at such time as diphenylhydantoin sodium proves ineffective as the sole agent for seizure control. When both are incapable of producing the desired result, addition of other drugs, such as methylphenylethylhydantoin, primidone, or mephobarbital, is indicated.

Phenobarbital.—The initial dose of phenobarbital for adults is usually 0.1 gm. a day given as a single dose at bedtime. If necessary, the dose may be gradually increased to 0.3 to 0.4 gm. administered in divided doses. Rarely will any beneficial effects occur beyond this dosage without many undesirable side-effects. Children over 2 years of age usually require the same doses as adults, and they tolerate the drug equally as well. For children under 2 years of age the dose should be computed on the basis of body weight.

The toxic effects seen with phenobarbital are usually not serious and are reversible when the drug is withdrawn or reduced in dosage. Drowsiness and lethargy are common at the onset of treatment and at higher dosage levels. In most instances these symptoms spontaneously disappear with the continued use of the drug. If they do not, the use of amphetamine sulfate, 5 to 20 mg. daily, or other suitable amphetamine derivatives can be tried, as it may alleviate the drowsiness without altering the anticonvulsant potency of the drug. Allergic maculopapular skin eruptions, either generalized or localized, over the limbs occur infrequently. These eruptions may occur at any time in the course of treatment even as late as 10 years after institution of treatment with phenobarbital. In the higher dosage range, ataxia of gait, vertigo, blurring of vision, and drowsiness occur with great frequency.

The chief limiting factor with phenobarbital is its narrow dosage range, since therapeutic and toxic doses are very close. Consequently its use is restricted to patients with infrequent seizures in whom control can be achieved by a moderate dose of the drug. In addition, it is an excellent adjunct to treatment with other anticonvulsants such as diphenylhydantoin sodium, as it has been found to act in a synergistic fashion.

Diphenylhydantoin Sodium.—The initial dosage of diphenylhydantoin sodium is 0.1 gm. two or three times a day best given after meals. It is then increased by 0.1-gm. increments at weekly intervals until optimum effect is obtained. In order to avoid a complicated schedule of dosage, the total daily amount of drug may be given as one dose or divided in two, giving half after breakfast and half after the evening meal. Most adults will tolerate between 0.4 and 0.6 gm.; occasionally, patients may tolerate as much as 1 gm. So critical is the optimum level of tolerance that 50 mg. may be the difference between seizure control and toxicity. Careful adjustment of dosage by trial and error must be carried out in each individual patient. In children under 6 years of age the starting dose is 32 mg. three times daily; in those above 6 years, 0.1 gm. twice daily.

The toxic effects of diphenylhydantoin sodium may be divided into those that are minor and do not interfere with treatment and those that are so disturbing to the patient that administration of the drug must be discontinued. The latter are infrequent. Gastric distress and nausea may occur with the initial doses. This is minimized by taking the drug at mealtime or with sodium bicarbonate. Transient nervousness, sleeplessness, and a feeling of unsteadiness are occasionally encountered during the first few days of treatment but subside with continued use. Nystagmus develops in most patients taking diphenylhydantoin sodium; this in itself is not serious and does not constitute a true toxic reaction. When this is associated with diplopia and ataxia of gait and limbs, reduction of the dose is necessary. Usually, reducing the dose by 0.1 gm. will alleviate these symptoms if they are mild. If they are more intense, cutting the dose in half for 3 to 5 days will be necessary. If the latter is done, the dose can be slowly increased again to a level just below that at which toxic reactions previously occurred.

Hypertrophy of the gums is a toxic effect uniquely seen with diphenylhydantoin sodium. It is distressing because of its cosmetic effects and its effect on dentition. It is primarily seen in children and young adults and does not occur in edentulous areas of the gums. It varies from slight puffiness and sponginess of the gums to hyperplasia that may completely bury the teeth. It bears no relationship to dosage and is rarely seen in the first few months of treatment. Good dental hygiene, with vigorous massage of the gums, should be practiced by all patients taking diphenylhydantoin sodium, as this seems to retard the process. When excessive overgrowth occurs, surgical excision is indicated. Rarely will administration of the drug have to be discontinued because of this finding.

Hirsutism is occasionally encountered, especially in children. In adolescent and preadolescent girls, this is

a disturbing symptom and may necessitate withdrawal of the drug; however, it is mild in most instances. Since it does not disappear with elimination of therapy, administration of the drug should not be discontinued unless this symptom is noted to be progressive.

Major allergic phenomena such as fever, polyarthropathy, and skin eruptions are rare, but they are causes for a change in anticonvulsant medication when they occur. The skin eruptions seen with diphenylhydantoin sodium are of two varieties. The first is an acute generalized morbilliform eruption with or without a temperature elevation, usually occurring about 2 weeks after treatment is begun. Discontinuing administration of the drug results in complete alleviation of this toxic manifestation. The second type of eruption is an exfoliative dermatitis, which may occur at any time in the course of treatment. Both of these skin eruptions subside when the drug is withdrawn. Though retrial beginning with smaller doses and increasing at smaller increments may be attempted, the chances for success are remote; it is best to employ one of the other anticonvulsants.

Additional Drugs.—More recently introduced anticonvulsants include some with serious irreversible side-reactions and others with less potential in controlling seizures. Their use usually is indicated after adequate trial of therapy with diphenylhydantoin sodium and/or phenobarbital has failed. Adequate trial implies the use of these two drugs alone and in combination with increasing doses until either seizure control or toxic reactions to the drug result. When toxic reactions of such a nature as to require withdrawal of either of these drugs results, another drug may be added to the nontoxic dosage of the previously tolerated anticonvulsant, with its dosage gradually increased. Administration of a previously tolerated anticonvulsant should not be abruptly discontinued, except in the rare instances of an acute allergic reaction, until a full dosage level of the newer drug has been attained. In most instances, administration of the initial drugs will not need to be discontinued at all, as the patient may remain on a combination of three or four drugs.

Methylphenylethylhydantoin. — When methylphenylethylhydantoin is being used as the sole anticonvulsant for adults, a dosage of 0.4 to 1 gm. must be attained for seizure control. Therapy is begun with 0.1 gm. of the drug three times a day, and the dose is gradually increased by 0.1-gm. increments at weekly intervals. When administration of the drug is being added to an existing anticonvulsant regimen, 0.1 gm. a day is given initially, with 0.1 gm. being added at weekly intervals. In children under 6 years of age, half doses are used—50 mg. three times a day.

Drowsiness is a frequent side-effect with methylphenylethylhydantoin and often limits its use in full therapeutic doses. Allergic skin eruptions are similar to those seen with diphenylhydantoin sodium but occur more frequently and necessitate withdrawal of the drug. The most serious toxic effect seen with methylphenylethylhydantoin is on the blood. Agranulocytosis, pancytopenia, and aplastic anemia, sometimes fatal, may occur with methylphenylethylhydantoin therapy. Though the highest incidence of these blood dyscrasias is during the first few months of treatment, they may occur at any time in the course of therapy. For this reason all patients taking this drug should be examined frequently and have a complete blood cell count once a month throughout the period of treatment.

Mephobarbital.—Mephobarbital is mainly used as a substitute for phenobarbital. In equivalent dosage, its sedative effect is less than that of phenobarbital, but it must be used in higher dosages to match the anticonvulsant action of phenobarbital. It is therefore used in double the phenobarbital dosage; its side-effects are similar.

Metharbital.—Metharbital has been recommended for seizures caused by organic brain disease. Its similarity to phenobarbital and mephobarbital makes this assumption extremely doubtful. Its main use would be as a substitute for phenobarbital since, in equivalent doses, there is less sedative action; however, in full therapeutic doses this difference disappears. In adults the initial dose is 0.1 gm. three times a day, increased to 0.6 gm. if necessary. In children, one-half the adult dose is used.

Primidone.—The starting dose of primidone is 0.25 gm., increasing by 0.25-gm. increments in the daily dose at weekly intervals. In order to achieve therapeutic effectiveness, 0.75 to 1.5 gm. daily is necessary. In children one-half the adult dose is used. Drowsiness, nausea, vomiting, dizziness, and ataxia are toxic manifestations. These symptoms subside with regulation of the dosage in most patients, but on occasion withdrawal is necessary. In most instances primidone cannot be given in large enough amounts to achieve seizure control without undesirable side-effects. Consequently, it rarely can be used by itself but must be combined with other drugs, usually diphenylhydantoin sodium.

Bromides.—Though bromides are now used rarely, they are indicated occasionally for patients in whom all other drugs have failed. The starting dose, either as the sodium or potassium salt, is 1 gm. twice daily in adults, increasing by 1-gm. increments at weekly intervals. Bromide levels at which anticonvulsant effects develop are highly individualized as are levels of toxicity. If a daily dose of 6 gm. is not effective, it is unlikely that further increase in dosage would be effective or tolerated. In children, the starting dose is 0.3 gm. three times daily, with gradual increases by 0.3-gm. increments until the effective dose is reached. Throughout treatment adequate intake of chlorides should be maintained to prevent undue replacement by bromides. It is not routine practice to test serum bromide levels in patients except when it is felt that the therapeutic range of the drug is being exceeded. The serum bromide level should be kept below 125 mg. per 100 cc., since most cases of bromism develop when the level is above 150 mg. per 100 cc. The toxic effects seen with bromides are mental dullness, psychoses, and skin eruptions.

Phenacemide.—Phenacemide is of extremely limited use because of its serious toxic effect. It may be tried as a last resort in patients with severe and frequent psychomotor seizures in whom seizure control cannot be obtained with other drugs. In adults the starting dose is 0.5 gm. three times a day. Its therapeutic dosage range

is 2 to 3 gm. a day. In children half doses are used—0.25 gm. three times a day. Phenacemide may produce serious toxic reactions, including personality disturbances with psychotic manifestations, toxic hepatitis, and blood dyscrasias. Some of these reactions may be irreversible and fatal; hence, utmost care must be exercised during use of the drug. Patients taking phenacemide should be examined frequently and have periodic blood counts and liver function tests. Use of the drug is contraindicated in patients with a history of previous psychoses or liver disease. Other toxic phenomena seen with phenacemide include nausea, vomiting, skin eruption, and drowsiness. In some instances these may be alleviated by adjustment of dosage but may also be severe enough to require withdrawal of the drug.

Acetazolamide.—The use of carbonic anhydrase inhibitors as anticonvulsant agents is relatively recent. In addition to inhibiting brain carbonic anhydrase, acetazolamide has acidifying and dehydrating properties. To which of these properties its anticonvulsant action can be attributed is unknown. Reports concerning the use of acetazolamide are few and vary as to the seizure types affected. In adults, the starting dose is 0.25 gm. three times a day with gradual increase by 0.25-gm. increments up to 1 gm. Large doses may produce drowsiness and paresthesia in the face and limbs. These symptoms disappear with reduction of dosage. Isolated instances of agranulocytosis, thrombocytopenia, and renal lesions, some fatal, have been reported during the short time this drug has been in use.

Combined Drugs.—Combinations of one of the hydantoins and barbiturates (with or without a stimulant to inhibit sedation) have been made available for ease of administration of these drugs. Their use is exceedingly limited under the program of drug administration as outlined previously, because the dosage of one cannot be adjusted without affecting the other. They can be used in the rare instance where a patient's condition has been stabilized on a combination of drugs, and the individual dosages fortuitously correspond to the fixed ratio of dosage in the combination. The dosages of a hydantoin and barbiturate (also combined with added methamphetamine) as provided by three such combinations, are detailed as follows: (1) diphenylhydantoin sodium, 60 mg., and mephobarbital, 90 mg.; (2) diphenylhydantoin sodium, 100 mg., phenobarbital, 30 mg., and methamphetamine hydrochloride, 0.25 mg.; and (3) methylphenylethylhydantoin, 100 mg., and phenobarbital, 20 mg.

Petit Mal

For success in the treatment of petit mal it is important to distinguish this seizure from other minor seizure types. Rigid adherence to the characteristics previously described and electroencephalographic confirmation are necessary. Drugs used for the treatment of petit mal are not effective against other types of seizures and are thought by some to precipitate major seizure phenomena. When petit mal coexists with other seizure types, adequate therapeutic doses of phenobarbital and diphenylhydantoin sodium are indicated as well.

Trimethadione.—The starting dosage of trimethadione is 0.3 gm. three times a day for adolescents and adults. Gradual increases in dosage are carried out until therapeutic effect is obtained, usually between 1.5 and 2.7 gm. daily. In children under 2 years of age, 0.15 gm. two or three times a day is the initial dosage, with increments of 0.15 gm.

The limiting minor side-reactions seen with trimethadione are photophobia, drowsiness, and nausea. The photophobia may disappear with continued therapy or be controlled by the use of dark glasses. Drowsiness and nausea are self-limited and spontaneously remit with continued therapy. Toxic dermatitis occurs with some frequency and is of the morbilliform or urticarial variety. The drug should be withdrawn immediately when rashes appear, but it may be retried, beginning with smaller doses and increasing by smaller increments at a slower rate.

The serious toxic reactions seen with trimethadione are aplastic anemia, agranulocytosis, and nephroses. A number of fatalities due to these complications have occurred; therefore, it is necessary that all patients taking this drug be examined frequently and that monthly blood cell counts be performed. Transitory decreases in the percentage of polymorphonuclear leukocytes without an absolute decrease in total leukocytes may occur during treatment with trimethadione. This does not necessitate withdrawal of the drug but requires added caution and more frequent blood cell counts. The appearance of signs of kidney dysfunction requires immediate withdrawal of the drug.

Paramethadione.—Paramethadione is a close congener of trimethadione. Its dosage schedule and toxicity are similar. Toxic manifestations are less frequent, and intolerance to trimethadione does not necessarily mean intolerance to paramethadione. Its use is indicated in those patients with petit mal seizures who are refractory to treatment or develop toxic reactions to trimethadione. Occasionally the combination of both drugs gives better results than either one alone. The same precautions that were detailed for trimethadione apply to the use of paramethadione.

Phensuximide.—Phensuximide is indicated for the treatment of petit mal when trimethadione and paramethadione, administered either alone or in combination, have proved ineffective. The starting dose is 0.5 gm. three times a day with gradual increments of 0.5 gm. Therapeutic effect is usually obtained in the range of 2 to 3 gm. a day. The limiting side-effects are nausea, vomiting, dizziness, drowsiness, and dream-like states. These disappear with adjustment of dosage or withdrawal of the drug. Transient microscopic hematuria has been reported during its administration, but all investigations are not in agreement as to its occurrence or significance. It would seem wise to do urinalyses and blood cell counts at stated intervals for patients receiving the drug for long periods until more is known about its toxic manifestations.

Status Epilepticus

The occurrence of seizures with such frequency that recovery from the effects of one attack does not occur before the next attack supervenes is termed status epi-

lepticus. Though this may occur with any of the seizure types, it is seen most frequently with grand mal. Its occurrence constitutes a medical emergency and is best handled in a hospital. Maintenance of fluid balance, prevention of hyperthermia, and good nursing care are essential throughout the period of coma.

Effective drugs for the treatment of status epilepticus are phenobarbital sodium, amobarbital sodium, and paraldehyde. They should be given in full therapeutic dosages by the intravenous route at the time of the first injection. Divided doses and serial use of many sedatives should be avoided as they may produce respiratory depression without seizure control.

The dosage for adults of phenobarbital sodium or amobarbital sodium is 0.4 to 0.8 gm. dissolved in distilled water. Either one of these drugs can be used, though phenobarbital sodium usually is preferred. If they are ineffective, 3 to 6 cc. of paraldehyde should be given intravenously. In children, one-half the adult dose is used.

Causes for Failure of Treatment

Long-term experience with the use of anticonvulsant drugs has shown that seizures can be completely controlled in 50% of the patients and greatly reduced in number in another 35%. To achieve these results, thorough evaluation of the neurological status, critical classification of the type of seizure, and establishment of adequate drug therapy are essential. Not infrequently one or the other of these criteria has been found to be lacking in patients classified as having uncontrolled seizures. Some of the common pitfalls that must be guarded against are therefore outlined.

Improper Classification of Seizure Type.—Since the physician rarely witnesses an actual seizure, he is dependent on the reporting of the patient and his relatives for details. Patients tend to speak in general terms rather than to give an actual description of the details of the seizure. To classify properly the type of attack, it is important to get as accurate a description as possible from the patient as well as from the family or others who have witnessed a seizure. The most frequent error encountered is the confusion of minor grand mal and psychomotor seizures with petit mal attacks. Rigid adherence to the description previously outlined for petit mal as well as electroencephalographic confirmation will avoid this error.

Failure to Recognize a Progressive Neurological Disease.—A complete neurological examination as well as routine and special laboratory procedures should be carried out prior to treatment. Periodic reexaminations are also a necessity, since seizures may be the initial symptom and precede other symptoms of tumor or degenerative diseases of the central nervous system by many years. The onset of other symptoms of these diseases may be mistaken for toxic reactions to drugs in patients under treatment for seizures.

Failure to Use Proper Drugs.—As previously indicated, some drugs are effective against only one type of seizure. This is particularly true of trimethadione, which is effective against petit mal but entirely ineffective against major seizures. Though hydantoin and barbiturate derivatives are effective against major attacks, they usually have little or no beneficial effect on petit mal seizures. The incorrect choice of a drug will give poor results.

Failure to Administer Proper Dosage.—Improper dosage far outnumbers all other factors as a cause for failure in the control of convulsive seizures. The use of anticonvulsant drugs in epilepsy is analogous to the use of insulin in diabetes: the dosage must be determined for each patient. Frequency of seizures and the appearance of untoward side-reactions to drugs are the indices by which dosages of anticonvulsants are established for the individual patient.

Frequent Shifting of Drugs.—The frequent shifting from one drug to another is extremely undesirable in the treatment of epilepsy. With each change in medication a new reservoir of drug has to be built up. The chief impetus for shifting drugs comes from the constant introduction of new medicaments. The patient looks to each new anticonvulsant as a possible cure and is desirous of trying something new. The physician, on the other hand, is usually dependent on the results in a relatively small series of cases in which clinical trial has been carried out. In most instances this only demonstrates the effectiveness of the drug as an anticonvulsant but rarely indicates its efficacy in comparison with longer-established drugs or allows for conclusive determination of its potential toxic phenomena. Consequently, administration of new anticonvulsant agents usually should be reserved for patients resistant to therapy with adequate dosages of well-established drugs.

Premature Withdrawal of Drugs.—Not infrequently, anticonvulsant medication is discontinued by either the physician or patient after a relatively short seizure-free period. Such practice usually results in a recurrence of attacks. Though the time interval for treatment is not absolute, most neurologists agree that treatment should continue for at least 2 to 3 years after the last seizure. When medication is to be discontinued it must be done gradually over a period of a year or so depending on the original dosage level.

Poor Indoctrination of Patients.—The process of trial and error to determine the proper drug and its optimum dosage cannot be expected to produce immediate results. Patients and their families must understand that beneficial effects in some cases may occur only after a protracted interval of time to allow for a sufficient build-up of anticonvulsant drugs. They should be warned against early discouragement and discontinuing use of drugs before they have had an adequate trial. Adults should be warned against the taking of alcoholic beverages. Periodic bouts or sustained intake of alcohol will counteract the beneficial effects of the drugs.

Lack of Recognition of Social and Economic Needs of Patients.—The patient must be made to feel that with control of his seizures the opportunity for assuming his rightful place in society exists. The physician must be in a position to dispel misconceptions concerning marriage and counsel the patient on education and job training. Failure to recognize these needs will often cause a patient to be too discouraged to continue his treatment.

MEDICAL LICENSURE STATISTICS FOR 1955

FIFTY-FOURTH ANNUAL PRESENTATION OF LICENSURE STATISTICS BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION

The data in the following annual report on Medical Licensure Statistics has been compiled by the staff under the supervision of Mrs. Anne Tipner, Assistant to the Secretary of the Council on Medical Education and Hospitals. The Council desires to express appreciation to the officers of the examining boards and licensing agencies who have cooperated in furnishing the official information essential in the preparation of this report.

Edward L. Turner, M.D., Secretary
Council on Medical Education and Hospitals

Table of Contents

	Page
INTRODUCTION	339
A MODERN MEDICAL PRACTICE ACT	339
MEDICAL LICENSURE STATISTICS	340
STATE BOARDS OF MEDICAL EXAMINERS	340
Licenses Issued	340
Candidates Examined by Medical Examining Boards	341
Consolidated Results of Examinations	346
Failures in Medical Licensure Examinations	347
Registration by Reciprocity and Endorsement	348
Licentiates Representing Additions to the Medical Profession	351
Registration of Physicians, 1904-1955	354
Graduates of Approved Schools and Others Registered, 1922-1955	355
Graduates of Unapproved Medical Schools Registered, 1951-1955	356
Graduates of Schools of Osteopathy Registered by Medical Examining Boards, 1951-1955	357
Preprofessional Requirements of Licensing Boards	359
Approval of Medical Schools	360
Professional Educational Requirements of Licensing Boards	360
Licensure, Registration, or other Requirements for Interns and Residents Serving in Hospitals	361
Temporary and Educational Permits, Limited and Temporary Licenses or Other Certificates Issued by Medical Licensing Boards	370
Required Internships	370
Schedule of Written Examination Dates and Reciprocity Meetings	370
Medical License Fees	370
Licensure on Government Credentials	370
Annual Registration	370
Licensure of Foreign-Trained Physicians	371
Corresponding Officers of State Boards of Medical Licensure	373
BOARDS OF EXAMINERS IN THE BASIC SCIENCES	374
NATIONAL BOARD OF MEDICAL EXAMINERS	376

INTRODUCTION

This report is the 54th annual compilation of information and statistics pertaining to medical licensure in the United States and its territories and outlying possessions by the Council on Medical Education and Hospitals of the American Medical Association. The report presents new developments in medical licensure and statistics for the medical examining boards of all the states, the District of Columbia, Alaska, the Canal Zone, Guam, Hawaii, Puerto Rico, and the Virgin Islands. The figures for Connecticut also include data reported by the homeopathic medical examining board of that state. The homeopathic boards in Louisiana and Maryland had no new licentiates last year. As in previous years, data are included pertaining to the National Board of Medical Examiners and the 21 boards of examiners in the basic sciences.

The compilations included in this study were obtained from official reports. The Council and THE JOURNAL express their appreciation to the officers of the examining and licensing agencies for these data and for other records furnished throughout the year to the office of the Council.

A MODERN MEDICAL PRACTICE ACT

One of the outstanding accomplishments of the Federation of State Medical Boards of the United States during the past year was the adoption of "A Guide to the Essentials of a Modern Medical Practice Act." This guide, developed after several years of study by a committee of the federation, is intended to (1) serve as a guide to those states and territories that may adopt a new medical practice act or may be amending existing laws and (2) encourage standardization of requirements and of regulations to better facilitate reciprocity and endorsement. In its early studies the committee gathered material from all state licensing boards, which revealed wide variations in their requirements and regulations. The guide in its final form covers (1) the purpose of a medical practice act, (2) the definition of the practice of medicine, (3) recommendations on the establishment of a licensing agency or board and its composition, (4) recommendations on licensure requirements, (5) examinations, (6) licenses without examination, (7) grounds for suspension and revocation of licenses, (8) definition of unlawful practice of medicine and violations and penalties, (9) proceedings for revocation and suspension, (10) injunction clause, and (11) rules and regulations to be adopted by licensing agencies. The form in which this material is to be published was not definitely decided by the federation in adopting the guide at its annual meeting on Feb. 14, 1956, but will be acted on by the executive committee of the federation in the near future. In its deliberations the federation sought the advice and counsel of the Law Department of the American Medical Association. The guide should prove to be a very useful compendium of information to the licensing agencies throughout the country, and the federation is to be complimented for its development and the recognition of a need for such a brochure.

In the descriptive data reference is made to the total number of boards for which figures are reported. The figures include the examining and licensing boards in the territories and outlying possessions and also the homeopathic board in Connecticut.

MEDICAL LICENSURE STATISTICS

The tables referring to medical licensure include figures for the number of candidates examined for medical licensure in 1955 and also for those licensed on the basis of reciprocity or endorsement of credentials. Other data are also included pertaining to the regulations for medical licensure both of physicians who secured their professional training in the United States and Canada and of physicians educated in other countries. The state boards are discussed first, followed by the basic science boards and the National Board of Medical Examiners.

STATE BOARDS OF MEDICAL EXAMINERS

Licenses Issued

During 1955 there were 14,840 licenses to practice medicine issued by 56 legally constituted medical examining boards granted authority to issue licenses to practice medicine and surgery. The number licensed by each board on the basis of written examination or by endorsement of credentials is shown in table 1. Of the 14,840 licenses issued, 7,379 were granted after written examination and 7,461 by reciprocity or endorsement of state licenses or the certificate of the National Board of Medical Examiners.

TABLE 1.—*Licenses Issued, 1955*

	Examination	On the Basis of Reciprocity and Endorsement	Total
Alabama	62	92	154
Arizona	9	72	81
Arkansas	83	33	116
California	603	1,415	2,018
Colorado	98	131	229
Connecticut	29	255	284
Delaware	20	20	40
District of Columbia	8	166	174
Florida	499	0	499
Georgia	209	90	299
Idaho	2	37	39
Illinois	435	213	648
Indiana	178	131	309
Iowa	122	74	196
Kansas	139	51	190
Kentucky	108	90	198
Louisiana	281	133	414
Maine	52	44	96
Maryland	270	193	463
Massachusetts	37	334	371
Michigan	304	203	507
Minnesota	221	140	361
Mississippi	75	66	141
Missouri	248	121	369
Montana	9	59	68
Nebraska	95	19	114
Nevada	1	19	20
New Hampshire	8	38	46
New Jersey	68	277	345
New Mexico	8	42	50
New York	323	1,044	1,367
North Carolina	203	75	278
North Dakota	22	17	39
Ohio	622	391	1,013
Oklahoma	69	64	133
Oregon	31	93	124
Pennsylvania	517	213	730
Rhode Island	43	21	64
South Carolina	69	60	129
South Dakota	13	23	36
Tennessee	198	87	285
Texas	430	209	639
Utah	25	38	63
Vermont	8	32	40
Virginia	202	136	338
Washington	63	146	209
West Virginia	21	73	94
Wisconsin	160	104	264
Wyoming	4	19	23
Alaska	6	12	18
Canal Zone	0	1	1
Guam	0	4	4
Hawaii	28	15	43
Puerto Rico	39	26	65
Virgin Islands	2	0	2
Totals	7,379	7,461	14,840

It does not follow that all physicians certified after written examination were tested in a given year. The licensing boards of 26 states, the District of Columbia, Alaska, the Canal Zone, Hawaii, and Puerto Rico require a year of internship as a prerequisite for licensure. A number of the boards permit the candidate for medical licensure to take the written examination after completion of the internship, and, if he is successful, the license is issued and dated on completion of the internship requirement. Licenses are also withheld in some states for other technicalities. As a rule, the licenses of those examined in December are dated and issued in the following year. The figures in table 1 will, therefore, not correspond with those in succeeding tables, which deal entirely with physicians examined for licensure in 1955, but they do include persons who may have been licensed in more than one state in a given year. In tables 11, 12, and 13 (pages 356 and 357 can be noted the number of physicians who secured their first licenses to practice medicine in 1955 and who thus represent additions to the medical profession in the United States and its territories and outlying possessions.

TABLE 2.—*Licenses Issued, 1935-1955*

Year	Examination	Reciprocity and Endorsement	Total
1935	5,725	2,194	7,919
1936	6,276	2,773	9,049
1937	6,629	3,205	9,834
1938	6,557	2,956	9,513
1939	6,400	2,872	9,272
1940	6,289	2,866	9,155
1941	6,057	2,762	8,819
1942	6,152	2,469	8,621
1943	6,062	2,340	8,402
1944	7,080	2,596	9,676
1945	5,580	3,622	9,202
1946	6,567	9,669	16,236
1947	6,763	7,701	14,464
1948	5,997	7,595	13,592
1949	5,252	6,929	12,181
1950	5,454	6,755	12,209
1951	5,713	6,225	11,938
1952	6,212	7,016	13,228
1953	6,565	7,869	14,434
1954	6,827	8,202	15,029
1955	7,379	7,461	14,840
Totals	131,536	106,077	237,613

The greatest number of licenses issued in 1955, both by examination and by reciprocity and endorsement of credentials, was granted by California. This state issued 2,018 licenses, New York 1,367, and Ohio 1,013. More than 500 physicians were registered in Illinois, Michigan, Pennsylvania, and Texas. The fewest were licensed in Nevada (20), while Delaware, Idaho, New Hampshire, North Dakota, South Dakota, Vermont, and Wyoming each issued less than 50 licenses. Among the territories and possessions, Puerto Rico licensed 65, Hawaii 43, Alaska 18, Guam 4, the Virgin Islands 2, and the Canal Zone 1.

There was a decrease of 189 in the total number of licenses issued in 1955 as compared with the previous year. The number of licenses issued by examination increased 552 over the previous year, while the number of licenses issued by reciprocity and endorsement decreased by 741.

Totals of the physicians licensed in 20 previous years and for 1955, both by examination and reciprocity or endorsement of credentials, are included in table 2. The variations shown for the years from 1936 to 1941, inclusive, were due to the increase in the licensure of foreign-trained physicians. The increases in recent years reflect the increase in the production of physicians, the mobility

TABLE 3.—*Source of Candidates Examined for Licensure in the United States, 1955*

Medical Schools	No. of Schools	No. Examined	No. Passed	No. Failed	% Failed
Approved schools in United States	74	6,254	5,979	275	4.4
Approved in Canada	11	136	131	5	3.7
Extinct	1	2	1	1	50.0
Foreign	199	1,777	1,042	735	41.4
Unapproved schools	5	57	14	43	75.4
Schools of osteopathy	7	275	233	42	15.3
Totals	..	8,501	7,400	1,101	12.9

of physicians, and the licensure of foreign-trained physicians. In 21 years, 1935-1955, the number of medical licenses issued in the United States and its territories and outlying possessions totaled 237,613, of which 131,536 were issued after written examination and 106,077 by endorsement of credentials.

Candidates Examined by Medical Examining Boards

Compilations referring to those examined for medical licensure in 1955 by 53 licensing [1] boards are given in table 4 (pp. 342-344). For each board the number who passed and failed is recorded, the medical school of graduation, and the percentage of failures for each school and for each licensing board, the number of states in which graduates of a given school were examined, and the percentage of failures for each school and each state. Medical schools in the United States that are no longer in operation, unapproved medical schools in the United States, foreign faculties of medicine, and schools of osteopathy are not listed by name, but the numbers examined in each state in these four categories are included after those for existing medical schools in the United States and Canada.

During 1955 there were 8,501 applicants for licensure by written examination, of whom 7,400 passed and 1,101, or 12.9%, failed. The candidates examined represented 74 approved medical schools in the United States, 11 approved medical schools of Canada, one approved medical school in the United States no longer operating, 199 faculties of medicine of foreign countries, 5 unapproved medical schools in the United States that are no longer in existence, and 7 schools of osteopathy. Osteopaths who were granted the privilege to practice medicine, surgery, or both by medical examining boards are included in these statistics. Osteopaths who obtain the legal right to special practice by other than medical examining boards are not included in these compilations.

Examination and reciprocity meetings are scheduled at frequent intervals by licensing boards in most of the states to facilitate licensure and enable physicians to commence the practice of medicine without undue delay. Later in this study there is included a tabulation giving the schedules for all states. The publication of the dates of examination and reciprocity or endorsement meetings is a regular biweekly feature of THE JOURNAL.

The 8,501 examiners (table 3) included 6,254 graduates of approved medical schools in the United States, of whom 4.4% failed; 136 graduates of approved medical schools in Canada, 3.7% of whom failed; 2 graduates of a medical school in the United States that is now extinct, one of whom failed; 1,777 graduates of 199 faculties of medicine located in countries other than the United States and Canada, 41.4% of whom failed; 57 graduates of unapproved medical schools in the United States no longer in existence, of whom 75.4% failed; and 275 graduates of schools of osteopathy, of whom 15.3% failed.

As in table 1, the 8,501 physicians and others examined do not represent an equal number of persons, since a candidate tested in more than one state in a calendar year is counted in each state; however, if a candidate failed more than once in a given state within the year, he he counted in that state as a single failure. Figures that show the number of individual licentiates added to the medical profession in 1955 are given in tables 11, 12, and 13 (pp. 356-357).

The greatest number of graduates of any one school examined was 204, representing a state university, the University of Illinois College of Medicine. Of the graduates of this school, 136 were tested in Illinois and 68 in 18 other states. The greatest number examined from a private school was 185, representing Jefferson Medical College; they were tested in 24 states, including 105 who were examined in Pennsylvania, where the school is located. Twenty-four other schools had more than 100 of their graduates examined for medical licensure in 1955 as follows:

State and Municipal Schools	No. of Examinees	No. of States in Which Examinations Were Taken
Medical College of Georgia	101	14
Indiana University	157	5
State University of Iowa	120	10
University of Kansas	131	6
University of Louisville	101	6
Louisiana State University	128	4
University of Maryland	120	10
University of Michigan	198	14
University of Minnesota	158	11
University of Cincinnati	112	8
Ohio State University	152	6
University of Pittsburgh	108	8
Southwestern Medical School	103	4
University of Texas	158	6
Private Medical Schools		
Emory University	109	4
Northwestern University	148	25
Tulane University	166	8
St. Louis University	138	10
Duke University	115	13
Temple University	131	19
University of Pennsylvania	142	19
Baylor University	102	12
Medical College of Virginia	128	10

Syracuse with 8 examinees, Albany Medical College with 9, and Boston University with 11 examinees had the fewest number of applicants for medical licensure by written examination before state boards. The majority of the graduates of these schools are licensed by endorsement of the certificate of the National Board of Medical Examiners. This is also true of other schools with small numbers of examinees.

1. Forty-eight state boards, the District of Columbia, Alaska, Hawaii, the Virgin Islands, and Puerto Rico.

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 Arkansas P	F	4 California P	F	5 Colorado P	F	6 Connecticut P	F	7 Delaware P	F	8 Dist. of Columbia P	F	9 Florida P	F	10 Georgia P	F	11 Idaho P	F	12 Illinois P	F	13 Indiana P	F	14 Iowa P	F	15 Kansas P	F	16 Kentucky P	F	17 Louisiana P	F	18 Maine P	F	19 Maryland P	F	20 Massachusetts P	F	21 Michigan P	F	22 Minnesota P	F
	ALABAMA																																										
1	Medical College of Alabama, Birmingham	81	0															3	0					1	0	1	0							1	0										
	ARKANSAS																																										
2	University of Arkansas School of Medicine, Little Rock			1	1	75	2											6	0					2	0															1	0				
	CALIFORNIA																																										
3	Coll. of Medical Evangelists, Loma Linda-Los Angeles							76	0	3	0							3	0	1	0	2	0									1	0					2	0			5	0	1	0
4	Univ. of So. California School of Med., Los Angeles							76	0																																			
5	Stanford Univ. School of Medicine, San Francisco							48	0															1	0																				
6	Univ. of California School of Medicine, San Francisco							81	0									1	0															1	0			1	0	3	0			1	0
7	Univ. of California School of Medicine, Los Angeles							13	0																																			
	COLORADO																																										
8	University of Colorado School of Medicine, Denver									1	0	74	0			1	0	2	0					1	1																	0	1		
	CONNECTICUT																																										
9	Yale University School of Medicine, New Haven							2	0									1	0	1	0					1	0							1	0							2	0		
	DISTRICT OF COLUMBIA																																										
10	Georgetown University School of Medicine													1	0	2	0	5	1																			3	0					
11	George Washington University School of Medicine					1	0	1	0			1	0	1	0			8	2															5	1			2	0					1	0
12	Howard University College of Medicine							5	0									0	1					1	1	3	0											19	6	0	1	1	0	1	0
	GEORGIA																																										
13	Emory University School of Medicine, Atlanta																	37	3	67	0																					1	0		
14	Medical College of Georgia, Augusta																	17	3	76	0			1	0									1	0							1	0		
	ILLINOIS																																										
15	Chicago Medical School																	1	1					6	1																				
16	Northwestern University Medical School, Chicago			1	0	1	0	11	0									9	2					52	14	3	0			1	0	1	0	2	0			1	0			7	0	8	0
17	Stritch School of Med. of Loyola University, Chicago							5	0	3	0							3	1	1	0			23	9	5	0							2	0					1	0	2	0	1	0
18	University of Chicago, The School of Medicine							3	0									3	2	1	0			17	6	3	0															3	0	1	0
19	University of Illinois College of Medicine, Chicago							24	0	1	0							10	3					104	32	1	0															8	0	3	0
	INDIANA																																										
20	Indiana University School of Medicine, Bloomington-Indianapolis																	11	5					5	4	128	2																		
	IOWA																																										
21	State University of Iowa College of Med., Iowa City							2	0	1	0							2	1					1	1			99	4													1	0	2	0
	KANSAS																																										
22	University of Kansas School of Medicine, Lawrence-Kansas City																	4	0					0	1					122	0													2	0
	KENTUCKY																																										
23	University of Louisville School of Med. Louisville																	7	1													88	0	1	0							1	0		
	LOUISIANA																																										
24	Louisiana State Univ. School of Med., New Orleans																	5	2																	115	1								
25	Tulane University School of Medicine, New Orleans																	20	2	2	0			1	1											108	0								
	MARYLAND																																										
26	Johns Hopkins University School of Med., Baltimore					1	0	2	0	1	0							5	0	2	0			2	1													57	0			1	0	1	0
27	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore													1	0			8	5					2	2									1	0			95	0	1	0	2	0		
	MASSACHUSETTS																																										
28	Boston University School of Medicine																	7	0																							1	0		
29	Harvard Medical School, Boston					1	0	2	0					1	0			8	3	1	0					2	0							2	0			1	0	7	0	1	0	1	0
30	Tufts College Medical School, Boston																	6	2					1	0	1	0							2	0							1	0	1	0
	MICHIGAN																																										
31	University of Michigan Medical School, Ann Arbor							4	0							1	0	9	5					1	0	1	0							1	0							167	0		
32	Wayne University College of Medicine, Detroit							4	0									1	0															2	0							65	0		
	MINNESOTA																																										
33	University of Minnesota Medical School, Minneapolis			1	0			1	0									8	4					3	0									1	0									13	0
	MISSOURI																																										
34	St. Louis University School of Medicine							1	0									5	1					3	1	1	0																	1	0
35	Washington University School of Medicine, St. Louis									1	0	1	0					7	0					2	1							1	0			1	0							1	0
	NEBRASKA																																										
36	Creighton University School of Medicine, Omaha							10	0			1	0					1	0					2	0			13	2					1	0			1	0					2	0
37	University of Nebraska College of Medicine, Omaha							1	0					0	1			3	1					1	0																	1	0		
	NEW YORK																																										
38	Albany Medical College							1	0									2	0					1	0																	2	0		
39	University of Buffalo School of Medicine					1	0	1	0									8	3																										
40	Columbia University College of Physicians and Surgeons, New York					1	0	2	0									6	1	1	0					1	0							1	0			1	0	2	0	1	0	1	0
41	Cornell University Medical College, New York							1	0					1	0			8	5	1	0			1	0													1	0	1	0	1	0	1	0
42	New York Medical College, Flower and Fifth Avenue Hospitals																	7	3	2	0					2	0																		
43	New York University College of Medicine							2	0									11	4																	1	0								
44	State University of New York College of Medicine, New York City									1	0							13	1							2	0									3	0					1	0		
45	Univ. of Rochester School of Medicine and Dentistry					1	0	1	0	1	1							5	2	3	0					2	0									1	0			2	0	1	0	1	0
46	State Univ. of New York College of Med., Syracuse									1	0							2	1																	1	0								
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22	

23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						
Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Virgin Islands, and Puerto Rico	Totals	Examined—Passed	Examined—Failed	% Failed	No. of Boards Examined by	Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
								1 0																				88	88	0	0.0	6	1
																												88	85	3	3.4	5	2
								0 1										1 0					2 0					98	97	1	1.0	12	3
																											1 0	77	77	0	0.0	2	4
																											1 0	50	50	0	0.0	3	5
																												88	88	0	0.0	6	6
																												13	13	0	0.0	1	7
		1 0													1 0											2 0	3 0	88	86	2	2.3	10	8
								1 0						4 0					1 0				2 0			1 0	17	17	0	0.0	11	9
1 0														6 0	1 0										1 0			20	19	1	5.0	7	10
									4 0					2 0					2 0						1 0			33	30	3	9.1	12	11
	3 0							3 5	2 0		1 0					1 0			1 0			1 0			1 0		1 0	88	74	14	15.9	17	12
								1 0																				109	106	3	2.8	4	13
								1 0																			1 0	101	98	3	3.0	7	14
								1 2						3 0											3 0			18	14	4	22.2	5	15
3 0	5 0	1 0				1 0		3 0		1 0	8 0			2 0		1 0			1 0	1 0			1 0		7 0	1 0	1 0	148	132	16	10.8	25	16
								1 0		1 0	3 0			3 0								1 0	1 0		3 0		1 0	71	61	10	14.1	19	17
	1 0	1 0						1 0			2 0								1 0				1 0					46	38	8	17.4	13	18
1 0	2 0							1 1	1 0	1 0	1 0			1 0				1 1 1	0				1 0		4 0		1 0	204	167	37	18.1	19	19
1 0																											1 0	157	146	11	7.0	5	20
	4 0										1 0														1 0			120	114	6	5.0	10	21
	1 0																										1 0	131	130	1	0.8	6	22
								1 1		1 0																		101	99	2	2.0	6	23
4 0																											0 1	128	124	4	3.1	4	24
22 0									1 0										1 1								7 0	166	162	4	2.4	8	25
3 0	1 0	1 0						2	0 1 0		1 0						2 0		2 0	1 0					2 0			80	88	1	1.1	19	26
								1 0														1 0			1 0			120	113	7	5.8	10	27
														1 0		1 0											1 0	11	11	0	0.0	5	28
2 0	5 0							2	1 1 0	1 0	4 0			4 0								1 0		2 0	1 0			54	50	4	7.4	21	29
										1 0				2 0					1 0									18	16	2	11.1	9	30
								2	0 1 0		2 0		1 0										1 0 1 0 1 0					198	193	5	2.5	14	31
								1 0																				73	73	0	0.0	5	32
										5 0					1 0					1 1					1 0		1 0	158	153	5	3.2	11	33
	1 1 2	0						5	0					5 0											2 0		1 0	138	136	2	1.4	10	34
4 0	7 9	0																										98	97	1	1.0	9	35
	5 1		24 1							1 0			4 0										6 0			1 0 3 0		79	75	4	5.1	15	36
			7 0 2							1 0			1 0				1 0							3 0				86	82	4	4.7	10	37
										1 0				2 0														9	9	0	0.0	6	38
								1 0						6 0														20	17	3	15.0	5	39
	1 0					2 0		3 0						2 0					3 0 0 1									30	28	2	6.7	16	40
2 0							1 0	3 0	2 0		2 0			2 0				1 0		1 0			1 0			1 0		37	32	5	13.5	19	41
			1 0					4	2					4 0	1 0				2 0									28	23	5	17.9	8	42
								6	3 1 0		1 0		1 0						1 0						1 0			32	25	7	21.9	9	43
	1 0					1 0		1	1					2 0	1 0	1 0			1 0				1 0					31	29	2	6.5	14	44
					1 0			5	0					4 0					1 0				1 0					34	31	3	8.8	16	45
														2 0					1 0									8	7	1	12.5	5	46
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						

Marginal Number	SCHOOL	1 Alabama P F	2 Arizona P F	3 Arkansas P F	4 California P F	5 Colorado P F	6 Connecticut P F	7 Delaware P F	8 Dist. of Columbia P F	9 Florida P F	10 Georgia P F	11 Idaho P F	12 Illinois P F	13 Indiana P F	14 Iowa P F	15 Kansas P F	16 Kentucky P F	17 Louisiana P F	18 Maine P F	19 Maryland P F	20 Massachusetts P F	21 Michigan P F	22 Minnesota P F
	NORTH CAROLINA																						
47	Duke University School of Medicine, Durham			1 0						15 0	5 0		1 0			1 0		6 0			1 0	1 0	
48	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem									8 1	1 0					1 0	1 0						
49	Univ. of North Carolina School of Med., Chapel Hill																						
	OHIO																						
50	University of Cincinnati College of Medicine				1 0					12 2			1 1									1 0	
51	Western Reserve University School of Med., Cleveland									3 0	1 0										1 0		
52	Ohio State University College of Medicine, Columbus				2 0		1 0			8 2													
	OKLAHOMA																						
53	Univ. of Oklahoma School of Med., Oklahoma City				3 0					1 0			2 0			9 0							
	OREGON																						
54	University of Oregon Medical School, Portland				12 0					1 0	1 0		1 0				1 0					5 0	
	PENNSYLVANIA																						
55	Hahnemann Med. Coll. and Hospital of Philadelphia				1 0			2 0		8 3										2 0		1 0	
56	Jefferson Medical College of Philadelphia	1 0			1 0		1 0	3 0		13 3	1 0		4 1	2 0			2 0	1 0	1 0			1 0	1 0
57	Temple University School of Medicine, Philadelphia	2 0			6 0	3 0		6 0		11 0				2 0	1 0		3 0				1 0	1 0	1 0
58	Univ. of Pennsylvania School of Med., Philadelphia				2 0		4 0		1 0	21 0										3 0		3 0	2 0
59	Woman's Medical Coll. of Pennsylvania, Philadelphia				2 0				1 0	1 0			1 0				1 0	1 0	1 0				
60	University of Pittsburgh School of Medicine				2 0					6 1						1 0		2 0				1 0	1 0
	SOUTH CAROLINA																						
61	Medical College of South Carolina, Charleston									3 2													
	TENNESSEE																						
62	University of Tennessee College of Med., Memphis				2 0				1 0	12 1	1 0		1 1			1 0							
63	Meharry Medical College, Nashville	3 0			2 1				1 0	7 0	36 0			1 0		6 0			1 1		2 0		
64	Vanderbilt University School of Medicine, Nashville				1 0					13 1							1 0						
	TEXAS																						
65	University of Texas Southwestern Med. School, Dallas									2 1													
66	University of Texas School of Medicine, Galveston									1 1			1 0										
67	Baylor University College of Medicine, Houston		3 1		1 0	1 0				0 2				1 0				2 0				1 0	
	UTAH																						
68	Univ. of Utah School of Medicine, Salt Lake City				11 0						1 0			1 0	1 0							1 0	2 0
	VERMONT																						
69	University of Vermont College of Med., Burlington						1 0			1 3			0 2						1 0				
	VIRGINIA																						
70	Univ. of Virginia School of Medicine, Charlottesville					1 0				11 2			1 1					1 0					
71	Medical College of Virginia, Richmond				1 0	1 0				10 1								1 0			1 0		
	WASHINGTON																						
72	University of Washington School of Med., Seattle				6 0								2 1	2 0				4 0		3 0			2 0
	WISCONSIN																						
73	University of Wisconsin Medical School, Madison				5 1				1 0	1 0			1 0	1 0									5 0
74	Marquette University School of Medicine, Milwaukee				11 0	3 0	1 0			4 0			3 0	1 0			1 0	1 0				3 0	3 0
	PUERTO RICO																						
75	Univ. of Puerto Rico School of Medicine, San Juan																						
	CANADA																						
76	University of Alberta Faculty of Med., Edmonton				2 0															1 0			2 0
77	University of British Columbia Faculty of Medicine, Vancouver																						
78	University of Manitoba Faculty of Med., Winnipeg		1 0		9 0								1 0					1 0				1 0	6 0
79	Dalhousie University Faculty of Medicine, Halifax						1 0																2 0
80	Queen's University Faculty of Medicine, Kingston				1 0																		2 0
81	University of Ottawa Faculty of Medicine													2 0						1 0		1 0	
82	Univ. of Western Ontario Faculty of Med., London																			1 0		2 0	1 0
83	University of Toronto Faculty of Medicine				4 0					2 0	1 0									4 0		1 0	1 0
84	McGill University Faculty of Medicine, Montreal		1 0	11 0			2 0			3 0			2 0			1 0		1 0	1 0		4 0	1 0
85	University of Montreal Faculty of Medicine																		0 1				1 0
86	Laval University Faculty of Medicine, Quebec				2 1														2 0		1 0		2 0
	OTHERS																						
87	Foreign medical faculties	1 1	2 1		135 46	3 0	13 16	1 1	2 0	27 13	2 0		157 205	2 2	4 4	3 6		1 0	44 44	55 26	11 15	40 1	17 1
88	Extinct medical schools									0 1													
89	Unapproved medical schools									7 9									1 0		1 3	3	
90	Schools of osteopathy				7	1 0	1 2	1					14 3	6 0							0 1		
91	**TOTALS**	89	12	85	666	107	46	23	10	619	209	2	719	182	128	140	101	283	97	323	88	337	222
92	Totals—Examined—Passed	88	9	83	617	106	28	20	10	499	209	2	428	178	118	140	101	281	52	290	37	336	221
93	Totals—Examined—Failed	1	3	2	49	1	18	3	0	120	0	0	291	4	10	0	0	2	45	33	51	1	1
94	% failed	1.1	25.0	2.4	7.4	0.9	39.1	13.0	0.0	19.3	0.0	0.0	40.5	2.2	7.8	0.0	0.0	0.7	46.4	10.3	1.1	0.3	0.5
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

P—Passed; F—Failed.

	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Virgin Islands, and Puerto Rico	Totals	Examined—Passed	Examined—Failed	% Failed	No. of Boards Examined by	Marginal Number
	P F	P F	P F	P F	P F	P F	P F	P F	P	F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50							
										72 1		2 0			1 0		4 0		4 0									115	114	1	0.9	13	47
		1 1								46 1																			61	58	3	4.9	6	48
										69 0																		1 0	61	61	0	0.0	2	49
									1	3		88 0			1 0											1 0			112	106	6	5.4	8	50
									3	0		82 0																	90	90	0	0.0	5	51
											1 0	134 0	4 0																152	150	2	1.3	6	52
																												1 0	16	16	0	0.0	5	53
			1 0										23 0								1 0		3 0		1 0		1 0	51	51	0	0.0	12	54
						1 0						2 0			63 0	1 0												83	80	3	3.6	9	55
2 0					15 0				3	1 1 0		14 0			104 1						1 1	1 0		2 0	1 0		2 0	185	178	7	3.8	24	56
					5 0							5 0			77 0				2 0		1 0	1 0	1 0				2 0	131	131	0	0.0	19	57
2 0				1 0	5 0				2	0 2 0		5 0			81 0	1 0			1 0					2 0	3 0		1 0	142	142	0	0.0	19	58
	1 0								2	1 2 0					22 0							1 0	1 0					38	37	1	2.6	13	59
												3 0			91 0													108	107	1	0.9	8	60
										1 0						88 0										1 0			95	93	2	2.1	4	61
18 0										1 0						1 0		148 0				0 1				1 0			190	187	3	1.6	12	62
2 0 7 3									2	1 2 0					1 0		1 0	1 0				1 1				1 0			84	77	7	8.3	18	63
1 0									1	0						1 0		46 0	1 0										66	65	1	1.5	8	64
3 0																			94 2								1 0		103	100	3	2.9	4	65
							1 0												151 1						1 0		1 0		158	156	2	1.3	6	66
1 0							1 0				1 0		1 0						86 0										102	99	3	2.9	12	67
		2 0																		19 1						1 0			40	39	1	2.5	9	68
						1 0						1 0							1 0		15 2								28	21	7	25.0	8	69
								0	1							1 0					58 2								79	73	6	7.6	7	70
								2	1 2 0												81 14		12 0	1 0					128	112	16	12.5	10	71
		1 0						1	1			3 0			1 0								36 0		1 0		1 0		65	63	2	3.1	13	72
	2 0									1 0	1 0				1 0				1 0 1 0					55 0		2 0		79	78	1	1.3	14	73
	1 1 1 0										4 0				3 0									1 0	48 0		3 0		93	92	1	1.1	17	74
																													0	0	0	0.0	0	75
				1 0					2	0					1 0												2 0		11	11	0	0.0	7	76
															1 0														1	1	0	0.0	1	77
									1	0	3 0	1 0											1 0		1 0				27	27	0	0.0	12	78
	1 1																												7	6	1	14.3	5	79
																			1 0								1 0		5	5	0	0.0	4	80
1 0																										1 0			5	5	0	0.0	4	81
									3	0													1 0		1 0				10	10	0	0.0	7	82
									1	1		2 0			2 0														19	18	1	5.3	9	83
	1 0					1 0		1 0	2	0					4 0								1 0						37	37	0	0.0	16	84
										0 1																			3	1	2	66.7	3	85
						2 0										1 0													11	10	1	9.1	6	86
2 0	14	5		0	2		3	1	23	3	4	0	159	224		5	0	160	65			6	1	35	12		4	1		16	8			54	35	5	0		2	0		30	2	1,777	1,042	735	41.4	36	87
									1	1					3 0														1	0	2	1	1	50.0	2	88
								8	0				92	28				73	8											25	4													57	14	43	75.4	6	89
75	269	9	100	1	9	65	8	609	206	24	677	5	31	519	55	99	15	198	417	28	21	255	63	21	159	4	80	8,501	275	233	42	15.3	11	90
75	248	9	95	1	8	62	8	329	203	24	609	5	31	517	43	99	13	198	401	25	18	202	63	21	159	4	77	...	7,400	..	....	..	91
0	12	0	5	0	1	3	0	280	3	0	68	0	0	2	12	0	2	0	16	3	3	53	0	0	0	0	3	...	...	1,101	....	..	92
0.0	4.6	0.0	5.0	0.0	11.1	4.6	0.0	45.9	1.5	0.0	10.0	0.0	0.0	0.4	21.8	0.0	15.4	0.0	3.8	10.7	14.3	20.8	0.0	0.0	0.0	0.0	3.7	...	...	..	12.9	..	93
23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						94

The following 15 approved schools in the United States had no failures among their graduates in medical licensing examinations last year:

	No. of Graduates Examined	No. of States in Which Examinations Were Taken
Medical College of Alabama	88	6
University of Southern California	77	2
Stanford University	50	3
Univ. of California, San Francisco	88	6
Univ. of California, Los Angeles	13	1
Yale University	17	11
Boston University	11	5
Wayne University	73	5
Albany Medical College	9	6
University of North Carolina	61	2
Western Reserve University	90	5
University of Oklahoma	16	5
University of Oregon	51	12
Temple University	131	19
University of Pennsylvania	142	19

Thirty-two schools had less than 5% and 13 between 5 and 10% failures among their graduates. There were 14 schools with 10% or more failures in state examinations. The over-all figures and percentages for failures are modified when included with the results of the final examinations of the National Board of Medical Examiners (see table 5).

Graduates of the University of California at Los Angeles appeared for the first time in state board examinations in 1955. Thirteen graduates were examined in California, and all passed. There were no graduates from the University of Puerto Rico School of Medicine examined in the United States in 1955.

There were 136 graduates of 11 approved medical schools in Canada tested for medical licensure in 1955 by 35 boards. The figures are given for each licensing board by school in table 4 and the numbers examined by each board in table 6. Of the 136 candidates, 131 passed and 5, or 3.7%, failed.

Graduates of foreign faculties of medicine were examined by 36 boards. There were 1,777 examined, of whom 1,042 passed and 735, or 41.4% failed. Graduates of five unapproved medical schools were examined by six states. There were 57 examined, of whom 14 passed and 43, or 75.4%, failed. Graduates of schools of osteopathy were tested in 11 states. Represented were 275 examinees, of whom 233 passed and 42, or 15.3%, failed. Two graduates of an approved medical school in the United States no longer in operation were examined in two states, one of whom failed. Elsewhere (tables 11, 12, and 13, pages 356 and 357 are given figures referring to actual licentiates and additions to the medical profession.

Consolidated Results of Examinations

In table 5 are presented the combined results of state board examinations and part 3 of the examinations of the National Board of Medical Examiners. This compilation reveals the over-all performance of physicians from individual schools. In some instances, schools having failures before state licensing boards had few, if any, failures in the National Board's final examination. There were 6,254 graduates of approved medical schools in the United States examined by state boards, of whom 275, or

TABLE 5.—*Combined Results of Examinations of State Boards and the National Board of Medical Examiners, 1955*

School	Results by Medical Examining Board Tests		Part 3 Examination of National Board of Medical Examiners		Total Examined	Totals		% Failed
	P	F	P	F		P	F	
Medical College of Alabama	88	0	1	0	89	89	0	0.0
University of Arkansas	85	3	0	0	88	85	3	3.4
College of Medical Evangelists	97	1	33	0	131	130	1	0.8
Univ. of Southern California	77	0	4	0	81	81	0	0.0
Stanford University	50	0	3	0	53	53	0	0.0
University of California, S. F.	88	0	3	0	91	91	0	0.0
University of California, L. A	13	0	0	0	13	13	0	0.0
University of Colorado	86	2	2	0	90	88	2	2.2
Yale University	17	0	65	0	82	82	0	0.0
Georgetown University	19	1	95	0	115	114	1	0.9
George Washington University	30	3	74	0	107	104	3	2.8
Howard University	74	14	12	0	100	86	14	14.0
Emory University	106	3	2	0	111	108	3	2.7
Medical College of Georgia	98	3	0	0	101	98	3	3.0
Chicago Medical School	14	4	72	0	90	86	4	4.4
Northwestern University	132	16	38	1	187	170	17	9.1
Stritch School of Medicine	61	10	16	0	87	77	10	11.5
University of Chicago	38	8	34	0	80	72	8	10.0
University of Illinois	167	37	31	0	235	198	37	15.7
Indiana University	146	11	2	0	159	148	11	6.9
State University of Iowa	114	6	9	0	129	123	6	4.7
University of Kansas	130	1	1	0	132	131	1	0.8
University of Louisville	99	2	6	0	107	105	2	1.9
Louisiana State University	124	4	0	0	128	124	4	3.1
Tulane University	162	4	0	0	166	162	4	2.4
Johns Hopkins University	88	1	5	0	94	93	1	1.1
University of Maryland	113	7	10	0	130	123	7	5.4
Boston University	11	0	69	0	80	80	0	0.0
Harvard Medical School	50	4	136	0	190	186	4	2.1
Tufts College Medical School	16	2	108	0	126	124	2	1.6
University of Michigan	193	5	7	0	205	200	5	2.4
Wayne University	73	0	2	0	75	75	0	0.0
University of Minnesota	153	5	2	0	160	155	5	3.1
St. Louis University	136	2	6	0	144	142	0	0.0
Washington University	97	1	17	0	115	114	1	0.9
Creighton University	75	4	5	0	84	80	4	4.8
University of Nebraska	82	4	6	0	92	88	4	4.3
Albany Medical College	9	0	43	0	52	52	0	0.0
State Univ. of N. Y., Brooklyn	29	2	133	3	167	162	5	3.0
University of Buffalo	17	3	69	1	90	86	4	4.4
Columbia University	28	2	111	2	143	139	4	2.8
Cornell University	32	5	71	0	108	103	5	4.6
New York Medical College	23	5	115	1	144	138	6	4.2
New York University	25	7	134	1	167	159	8	4.8
University of Rochester	31	3	57	0	91	88	3	3.3
State Univ. of N. Y., Syracuse	7	1	64	0	72	71	1	1.4
University of North Carolina	61	0	1	0	62	62	0	0.0
Duke University	114	1	22	0	137	136	1	0.7
Bowman-Gray School of Med.	58	3	0	0	61	58	3	4.9
University of Cincinnati	106	6	3	0	115	109	6	5.2
Western Reserve University	90	0	4	0	94	94	0	0.0
Ohio State University	150	2	11	0	163	161	2	1.2
University of Oklahoma	16	0	1	0	17	17	0	0.0
University of Oregon	51	0	4	0	55	55	0	0.0
Hahnemann Medical College	80	3	49	0	132	129	3	2.3
Jefferson Medical College	178	7	28	0	213	206	7	3.3
Temple University	131	0	37	0	168	168	0	0.0
University of Pennsylvania	142	0	39	1	182	181	1	0.6
Woman's Medical College	37	1	17	1	56	54	2	3.6
University of Pittsburgh	107	1	2	0	110	109	1	0.9
Med. College of South Carolina	93	2	1	0	96	94	2	2.1
University of Tennessee	187	3	3	0	193	190	3	1.6
Meharry Medical College	77	7	3	0	87	80	7	8.0
Vanderbilt University	65	1	0	0	66	65	1	1.5
Southwestern Medical School	100	3	0	0	103	100	3	2.9
University of Texas	156	2	0	0	158	156	2	1.3
Baylor University	99	3	1	0	103	100	3	2.9
University of Utah	39	1	2	0	42	41	1	2.4
University of Vermont	21	7	36	1	65	57	8	12.3
University of Virginia	73	6	2	0	81	75	6	7.4
Medical College of Virginia	112	16	8	0	136	120	16	11.8
University of Washington	63	2	7	0	72	70	2	2.8
University of Wisconsin	78	1	0	0	79	78	1	1.3
Marquette University	92	1	13	0	106	105	1	0.9
University of Puerto Rico	0	0	16	0	16	16	0	0.0
Subtotals: U. S. Schools	5,979	275	1,983	12	8,249	7,962	287	3.5
University of Alberta	11	0	0	0	11	11	0	0.0
University of British Columbia	1	0	0	0	1	1	0	0.0
University of Manitoba	27	0	1	0	28	28	0	0.0
Dalhousie University	6	1	0	0	7	6	1	14.3
Queen's University	5	0	0	0	5	5	0	0.0
University of Ottawa	5	0	1	0	6	6	0	0.0
University of Western Ontario	10	0	1	0	11	11	0	0.0
University of Toronto	18	1	3	0	22	21	1	4.5
McGill University	37	0	32	0	69	69	0	0.0
University of Montreal	1	2	2	0	5	3	2	40.0
Laval University	10	1	0	0	11	10	1	9.1
Subtotals: Canadian Schools	131	5	40	0	176	171	5	2.8
Extinct medical schools	1	1	0	0	2	1	1	50.0
Unapproved medical schools	14	43	1	0	58	15	43	74.2
Osteopathic schools	233	42	0	0	275	233	42	15.3
Foreign medical faculties	1,042	735	53	1	1,831	1,095	736	40.2
Totals	7,400	1,101	2,077	13	10,591	9,477	1,114	10.5

4.4%, failed. In the same calendar year, 1,995 graduates of these schools appeared for part 3 of the examinations of the National Board, of whom 12, or 1.1%, failed. For both groups, the total examined was 8,249, and the percentage of failures was 3.5.

There were 176 graduates of approved medical schools in Canada examined by both state boards and the National Board in 1955; 3.7% failed state board tests, and none failed the National Board's examination.

TABLE 6.—*Graduates of Medical Schools in Canada Examined for Licensure in the United States, 1955*

	Examined	Passed	Failed
Arizona	1	1	0
Arkansas	1	1	0
California	30	29	1
Connecticut	3	3	0
Florida	5	5	0
Georgia	1	1	0
Illinois	3	3	0
Indiana	2	2	0
Kansas	1	1	0
Louisiana	1	1	0
Maine	4	3	1
Maryland	9	9	0
Massachusetts	2	2	0
Michigan	9	9	0
Minnesota	18	18	0
Mississippi	1	1	0
Missouri	3	2	1
Nevada	1	1	0
New Hampshire	3	3	0
New Mexico	1	1	0
New York	10	9	1
North Carolina	1	0	1
North Dakota	3	3	0
Ohio	3	3	0
Pennsylvania	8	8	0
Rhode Island	1	1	0
South Dakota	1	1	0
Texas	1	1	0
Virginia	1	1	0
Washington	2	2	0
West Virginia	1	1	0
Wisconsin	2	2	0
Alaska, Hawaii, and Puerto Rico	3	3	0
Totals	136	131	5

The National Board examined one candidate in the unapproved medical school category and none from extinct medical schools or schools of osteopathy. Fifty-four graduates of foreign medical faculties were admitted to the National Board's examination, while 1,777 were examined by state licensing boards.

The totals of all examined before medical licensing examinations, as shown in table 3, was 8,501, of whom 7,400 passed and 1,101, or 12.9%, failed. In both state board and National Board Tests, there were 10,591 examined, of whom 9,477 passed and 1,114, or 10.5% failed.

Failures in Medical Licensure Examinations

During 1955, as recorded in table 4, 1,101 of the 8,501 examinees for medical licensure failed. In table 7 are recapitulated the numbers examined in each state, the number who failed the examination and the percentage of failures. Eighteen states had no failures among their examinees, 14 states failed less than 5%, 3 boards failed between 5 and 10%, while the percentage of failures in 15 states was more than 10%. It can be noted referring to table 4 that those states with high percentages of failures examine a considerable number of foreign-trained physicians. The one exception is Florida. This state has no reciprocal provisions for medical licensure, and physicians planning semi retirement or full retirement in a more ideal climate seek licensure in this state. Many of these physicians have graduated from medical schools in the early years of the century and experience difficulty in writing examinations. Florida likewise examined graduates of unapproved medical schools, resulting in a high percentage of failures.

In general, state licensing boards require the applicant to receive an over-all average of 75%, and at least 60% in any one subject. In case of failure in not more than two subjects, the applicant is permitted a second examination in those subjects within 12 months. A few states consider such persons as conditioned in the subjects in which they fail. Conditioned candidates are not counted as failures in these statistics. When their grades are raised after a successful examination, they are recorded among those who passed.

Of the 14,840 persons obtaining licenses in 1955, 334 failed state board tests before obtaining a license. Of these, 168 had one previous failure, 72 had two failures, 43 had three failures, and 51 had four or more failures. Eight physicians had failures ranging from 1 to 17, while one physician had 33 failures before securing licensure. Of the 334 licentiates with previous failures, 299 were graduates of foreign medical faculties. A few of the state boards have no restrictions on the number of examinations that may be taken prior to licensure, but most states have a set limit of three examinations.

TABLE 7.—*Failures in Medical Licensure Examinations, 1955*

State in Which Examined	No. Examined	No. Failed	Failures, %
Alabama	89	1	1.1
Arizona	12	3	25.0
Arkansas	85	2	2.4
California	666	49	7.4
Colorado	107	1	0.9
Connecticut	46	18	39.1
Delaware	23	3	13.0
District of Columbia	10	0	0.0
Florida	619	120	19.3
Georgia	209	0	0.0
Idaho	2	0	0.0
Illinois	719	291	40.5
Indiana	182	4	2.2
Iowa	128	10	7.8
Kansas	140	0	0.0
Kentucky	101	0	0.0
Louisiana	283	2	0.7
Maine	97	45	46.4
Maryland	323	33	10.3
Massachusetts	88	51	1.1
Michigan	337	1	0.3
Minnesota	222	1	0.5
Mississippi	75	0	0.0
Missouri	260	12	4.6
Montana	9	0	0.0
Nebraska	100	5	5.0
Nevada	1	0	0.0
New Hampshire	9	1	11.1
New Jersey	65	3	4.6
New Mexico	8	0	0.0
New York	609	280	45.9
North Carolina	206	3	1.5
North Dakota	24	0	0.0
Ohio	677	68	10.0
Oklahoma	5	0	0.0
Oregon	31	0	0.0
Pennsylvania	519	2	0.4
Rhode Island	55	12	21.8
South Carolina	99	0	0.0
South Dakota	15	2	15.4
Tennessee	198	0	0.0
Texas	417	16	3.8
Utah	28	3	10.7
Vermont	21	3	14.3
Virginia	255	53	20.8
Washington	63	0	0.0
West Virginia	21	0	0.0
Wisconsin	159	0	0.0
Wyoming	4	0	0.0
Alaska, Hawaii, Virgin Islands, and Puerto Rico	80	3	3.7
Totals	8,501	1,101	12.9

Registration by Reciprocity and Endorsement

The reciprocity and endorsement policies in medical licensure in the United States, Alaska, the Canal Zone, Hawaii, Puerto Rico, and the Virgin Islands are summarized in table 8. Florida is the only state that requires all applicants for licensure to pass a written examination. Hawaii and the Virgin Islands do not have reciprocal relations with any state, but Hawaii will endorse physicians certified by the National Board of Medical Examiners. Twenty boards require applicants for licensure to obtain a certificate from the board of examiners in the basic sciences of the state. In the section of this report pertaining to basic science boards is included a table outlining the reciprocity, endorsement, exemption, or waiver policies of these boards.

TABLE 8.—RECIPROCITY AND ENDORSEMENT

Marginal Number	The Examining Board of	Reciprocates with, or Endorses Certificates Granted by: Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	Marginal Number
1	Alabama	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
2	Arizona	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
3	Arkansas	+	+	..	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	3
4	California	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4
5	Colorado	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
6	Connecticut	..	..	..	..	..	..	..	+	..	..	+	..	+	..	+	..	+	+	+	+	+	..	..	..	..	..	..	+	..	..	6
7	Delaware	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7
8	District of Columbia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8
9	Florida	No reciprocity or endorsement policies																													9
10	Georgia	+	..	+	+	+	..	..	+	..	..	..	+	+	+	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	10
11	Idaho	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11
12	Illinois	+	..	+	+	+	..	..	..	..	+	..	..	+	+	+	..	..	+	..	+	..	+	..	+	..	+	..	+	..	+	..	12
13	Indiana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13
14	Iowa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14
15	Kansas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15
16	Kentucky	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16
17	Louisiana	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	17
18	Maine	..	..	+	+	+	+	+	+	..	+	..	..	+	+	+	+	+	..	..	+	+	+	..	+	+	+	+	+	+	+	+	18
19	Maryland	+	..	+	+	..	+	+	+	..	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	19
20	Massachusetts	+	..	..	..	..	+	+	+	..	+	+	..	+	+	+	+	+	+	+	..	..	..	+	+	+	..	..	+	+	..	+	20
21	Michigan	+	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	21
22	Minnesota	+	+[41]	+	+	+[41]	+[41]	+	+	..	+	+[41]	+	+[41]	+	+[41]	+[41]	+	+	+	+[41]	+	..	+	+	+	+	+	+[41]	+	+	+	22
23	Mississippi	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	23
24	Missouri	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	24
25	Montana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	25
26	Nebraska	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	26
27	Nevada	+	..	+	+	+	..	..	+	..	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	..	+	+	..	27
28	New Hampshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	28
29	New Jersey	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	29
30	New Mexico	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	30
31	New York	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31
32	North Carolina	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	32
33	North Dakota	+	..	+	+	+	..	..	..	..	+	..	+	+	+	+	+	+	+	..	..	..	+	..	+	+	+	+	+	+	+	+	33
34	Ohio	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	34
35	Oklahoma	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	35
36	Oregon	+	+	+	+	+	+	+	..	..	+	+	+	+	+	..	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	36
37	Pennsylvania	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	37
38	Rhode Island	..	+	+	+	+	+	..	+	..	+	+	+	+	+	+	..	..	+	+	+	+	+	+	..	+	+	+	+	+	+	+	38
39	South Carolina	+	..	..	..	..	..	..	+	..	+	..	..	+	+	+	+	+	+	..	+	..	+	+	+	+	..	+	+	+	+	..	39
40	South Dakota	+	+	+	+	+	..	..	..	..	+	..	+	+	+	+	+	..	..	..	+	+	+	+	+	+	+	+	+	..	..	+	40
41	Tennessee	+	+	+	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	41
42	Texas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	42
43	Utah	+	+	+	+	+	+	+	..	..	..	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	43
44	Vermont	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	44
45	Virginia	..	..	..	..	..	..	..	..	18	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18	..	..	..	45
46	Washington	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	46
47	West Virginia	+	..	+	20	20	+	+	+	..	+	..	+	20	20	20	20	+	+	+	20	+	+	+	+	+	+	+	..	+	..	47
48	Wisconsin	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48
49	Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
50	Alaska	+	..	+	+	+	+	..	+	..	..	..	..	+	..	+	+	..	..	+	..	+	+	+	+	..	..	+	+	+	..	50
51	Canal Zone	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	51
52	Guam	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	52
53	Hawaii	No reciprocal relations																													53
54	Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	+	..	+	..	..	..	..	54
55	Virgin Islands	No reciprocal relations																													55

This summary should be supplemented by direct communication with the

Some states have additional requirements for graduates of schools outside the United States and Canada.

+, indicates reciprocal or endorsement relationships have been established; .. indicates no reciprocal or endorsement relationships have been established. (See column—"At the discretion of the board.")

1. 1st P, first papers required; ⊕, in citizenship column indicates full citizenship required, in other columns it implies a requirement.
2. In most cases there is a small additional recording or registration fee.
3. Year of practice after internship required.
4. Internship accepted in lieu of one year's practice.
5. Professional practice required.
6. All applicants must be graduates of a medical school approved by the American Medical Association.
7. Just preceding application
8. No basic science reciprocity—examination must be within the state.
9. Basic science certificate required either by reciprocity or examination in addition to basic science subjects of National Board.
10. Canadian citizens are required to file first papers.
11. Not applicable to citizens of Canada.
12. Oral examination required when application is based on a license dated five or more years prior to filing application.
13. No reciprocity.
14. Oral examination required.
15. Endorsement of National Board of Medical Examiners $35.
16. Actual practice for a period of three years immediately preceding date of application.
17. Practical, clinical examination required.
18. In lieu of its own examination, certificate of National Board may be accepted in whole or in part.
19. Minimum fee.
20. Licentiates of California, Colorado, Indiana, Iowa, Kansas, Massachusetts, New York, and Rhode Island accepted on reciprocal basis at discretion of board.
21. Not required if country in which applicant is licensed will admit to practice citizens of the United States licensed to practice in some

Twenty-eight states, Alaska, and Puerto Rico have reciprocal agreements with specific states. In 22 states reciprocity is extended at the discretion of the licensing boards. Eighteen states, which have reciprocal agreements, also have similar discretionary powers to endorse

applicants from nonreciprocating states who present credentials that correspond with those required by their respective states in the year issued. Also in this table is a column indicating the recognition accorded the certificate of the National Board of Medical Examiners.

is indicated by footnote. Few states will accept graduates of foreign faculties of medicine on a reciprocal basis. Other requirements or exemptions are indicated by footnotes; footnote numbers are referred to in the Miscellaneous column in the table.

POLICIES OF MEDICAL LICENSING BOARDS

Marginal Number	Reciprocates with, or Endorses Certificates Granted by: New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska	Puerto Rico	At the Discretion of the Board	National Board of Medical Examiners	Requirements: Basic Science Certificate	Internship	Professional Practice	Citizenship [1]	Fees, Dollars [2]	Miscellaneous	Marginal Number
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+		⊕	14	⊕11	50	..	1
2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	316	1st P	100	41	2
3	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	⊕	..	14	⊕	50	42	3
4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	0	⊕21	100	12	4
5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+43	+9	⊕	⊕	..	⊕	50	42	5
6	..	..	..	+	..	..	+	+	..	..	+	+	..	+	..	..	+	..	..	..	..	+	+	⊕	⊕	316	1st P10	75	15	6
7	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+8	..	⊕	2	⊕	100	..	7
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+27	⊕32	⊕	18	..	50	..	8
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9
10	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	..	+35	..	..	0	⊕	50	..	10
11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	..	⊕	100	..	11
12	..	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	+17	..	⊕	1	1st P	25	17,42	12
13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	..	..	14	..	100	..	13
14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	14	1st P	50	39,6	14
15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	14,7	⊕	50	42	15
16	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	..	⊕	75	..	16
17	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	..	..	28	14	1st P40,10	5028	42	17
18	..	..	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	+	..	⊕	14	⊕	50	..	18
19	+	+	..	+	+	+	+	+	+	..	+	+	..	+	+	..	+	+	..	+	+	+	+	..	..	14	1st P	50	42	19
20	+	+	..	+	+	+	..	+	+	..	+	+	+	+	+	..	+	+	..	..	..	+	+	..	..	0	1st P	50	..	20
21	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	⊕37	⊕	14	⊕	100	34	21
22	+41	+	..	+41	+	+	+	+41	..	+	+	+	..	+	+	+	+	+	+	+	+	+	+	⊕	..	0	+	100	11,17,42	22
23	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	..	⊕11	50	..	23
24	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+27	..	⊕33	14	⊕	100	..	24
25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	14	⊕	75	14,42	25
26	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	⊕	..	14	⊕	5035	..	26
27	+	+	..	+	+	+	+	+	..	+	+	+	+	+	..	+	+	+	..	+	..	..	+	⊕	..	14	⊕	200	14,42	27
28	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	⊕	0	⊕11	50	..	28
29	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	⊕	0	⊕	100	..	29
30	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	..	14	1st P	50	..	30
31	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	2	1st P	30	..	31
32	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	..	..	..	0	⊕	100	42,6	32
33	..	+	..	+	+	+	+	..	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	..	⊕	1	⊕11	50	14,42	33
34	+	+	+	..	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	..	..	14	⊕	50	..	34
35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕32	..	14	..	100	11,6	35
36	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+9,27	⊕	⊕	..	⊕	100	6,42	36
37	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+28	..	⊕	224	1st P	50	42	37
38	..	+	..	+	+	..	+	..	..	..	+	..	..	+	..	+	+	+	+	..	..	+14	+14	⊕	⊕	0	1st P	20	34	38
39	..	+	..	+	+	+	+	..	..	..	+	+	..	..	+	..	+	+	+	..	+	..	+	..	⊕	14	⊕	50	42	39
40	..	+	+	+	+	+	..	+	..	+	+	+	+	+	+	+	+	+	+	..	..	..	+	⊕	⊕	1	1st P	50	..	40
41	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+	+	+	+	..	..	+	+30	⊕	..	0	⊕	50	42	41
42	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	..	⊕	..	0	..	100	..	42
43	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	..	+	+	..	⊕	31	..	50	42	43
44	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+22	..	⊕	18	⊕	50	11	44
45	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	13	..	..	..	..	..	+39	+	..	..	226	1st P	100	..	45
46	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	⊕	⊕	0	..	25	..	46
47	20	+	+	+	+	+	+	20	+	+	+	+	+	+	+	..	+	+	+	..	..	..	+	⊕	⊕	0	⊕	100	..	47
48	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	..	+	+	+	+	+	+14	+18	⊕	⊕	129	1st P	7518	6	48
49	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+14	+14	..	⊕	0	⊕	50	..	49
50	..	+	+	+	+	+	..	..	..	..	+	+	+	+	+	+	+	+	..	..	..	..	+	⊕	⊕	0	⊕	100	6	50
51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+44	⊕	⊕	245	..	5	..	51
52	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	+	..	..	0	..	50	6	52
53	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	+	..	⊕	..	⊕	25	42,6	53
54	..	..	+	..	..	..	..	+	..	..	..	..	..	..	..	..	..	+	..	..	..	+6,39	+	..	..	18	⊕	30	..	54
55	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	⊕	..	..	65	42	55

secretary of the licensing board of the state in which the physician is interested.

state or on proof of requirements similar to those required by California for graduates of foreign medical schools.

22. Fee $20.

23. Oral examination required if applicant's state requires it.

24. If the applicant passes the examination in the state from which he transfers after the completion of his internship, no practice is required.

26. Internship accepted at the discretion of the board as the equivalent of two years' practice.

27. Fee, $25.

28. Fee same as applicant's state charges but not less than $50.

29. A two year internship or a year of residency is accepted.

30. Diplomates of National Board not required to have been in practice for three years.

31. Same as required of candidates of state applying for licensure.

32. Not required for licensure by reciprocity.

33. Reciprocity applicants only.

34. Supplemental examination required in certain cases when accepting the examination of a state with whom reciprocal relations have not been established.

35. Applicants issued certificates prior to October, 1953, acceptable.

36. Fee same as applicant's state charges but not less than $75.

37. For matriculants after Oct. 15, 1937.

38. Applicants issued certificates prior to Sept. 1, 1954, acceptable.

39. Reciprocity extended at discretion of board to candidates whose qualifications would entitle them to admission to examination and who took examination equivalent to that required by this board.

40. Permanent license withheld until completion of citizenship.

41. At the discretion of the board.

42. Graduates of foreign medical schools are not accepted for licensure by reciprocity.

43. Reciprocity extended at discretion of board to states having comparable licensing requirements and which accept Colorado applicants on a substantially equal reciprocal basis.

44. At discretion of Health Bureau.

45. Consecutive years immediately preceding application.

Additional requirements, including professional practice, citizenship, oral examination and internship, and the fee for a license by reciprocity or endorsement, are also recorded. In some states, physicians of Canadian birth are exempt from the citizenship requirement. This

This chart will be made available in reprint form. It is helpful to physicians who are considering a change in location. The facts recorded in this table are intended to present merely statements of licensure policies. The information here given should be supplemented by direct

TABLE 9.—CANDIDATES LICENSED BY RECIPROCITY AND ENDORSEMENT OF CREDENTIALS, 1955

Source of Former License or Credentials

States Issuing Licenses by Reciprocity or Endorsement	Total Licensed	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U.S. Govt. Services	National Board of Medical Examiners	Alaska, Canal Zone, Hawaii, Puerto Rico	Canadian, Foreign
Marginal Number.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Alabama	92	..	..	4	1	2	..	..	..	..	14	..	2	..	..	2	1	7	..	3	..	..	..	2	2	..	..	..	..	..	..	..	3	..	3	2	..	..	..	2	..	23	2	..	..	4	..	..	..	..	1	12	..	..
Arizona	72	..	..	1	1	2	1	..	1	..	1	..	7	..	4	1	..	..	..	..	..	5	5	..	4	..	2	..	..	1	..	4	2	..	7	1	..	2	1	..	1	3	1	..	..	1	2	..	2	..	..	9	..	..
Arkansas	33	..	..	..	..	1	..	..	1	..	..	..	1	..	..	..	1	2	..	2	..	..	..	..	2	..	1	..	..	..	..	1	..	..	1	..	..	..	..	2	..	..	..	..	..	..	2	..	..	1	..	..	....	..	..
California	1,415	2	4	8	..	27	3	1	10	4	9	4	130	40	40	29	15	20	1	25	4	48	69	5	68	4	35	1	..	7	..	28	14	6	81	14	23	44	..	8	2	25	31	13	2	14	24	2	36	..	21	403	11	..
Colorado	131	..	..	1	7	..	..	1	..	..	1	..	2	..	6	5	1	3	1	1	..	6	9	1	22	..	8	1	..	..	..	2	..	..	8	3	..	3	1	..	..	2	7	1	..	2	1	..	1	..	..	24	..	..
Connecticut	255	..	..	..	3	..	..	..	..	..	1	..	1	..	..	..	..	1	2	11	2	1	1	..	4	..	2	..	..	..	..	4	..	29	1	..	8	1	..	12	1	..	..	1	..	..	..	2	1	..	..	..	168	..	..
Delaware	20	..	..	..	..	..	..	..	1	..	..	..	1	1	..	1	..	..	..	3	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	4	..	..	..	..	..	..	..	2	..	..	..	..	..	4	..	..
District of Columbia	166	..	..	..	3	..	1	..	..	..	4	..	3	2	1	..	..	2	..	23	..	2	5	..	1	..	1	..	1	1	..	3	1	..	1	..	..	6	..	1	..	2	..	..	..	5	..	1	1	..	..	92	..	3
Florida	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	..	..
Georgia	90	1	..	1	2	..	..	..	..	..	..	..	4	2	..	..	7	9	1	8	..	2	1	3	3	..	..	..	..	..	..	..	7	1	4	..	..	5	..	5	1	7	2	..	..	2	..	..	..	..	..	12	..	..
Idaho	37	..	..	..	6	..	..	..	..	..	..	..	1	..	..	..	..	1	..	1	..	..	3	..	2	..	..	..	..	..	..	..	..	..	..	1	..	..	4	..	..	1	1	1	2	1	1	1	1	1	..	..	8	..	..
Illinois	213	1	..	..	11	2	..	..	..	..	..	..	..	9	7	2	3	5	..	6	..	11	3	2	11	..	4	..	..	2	..	1	..	..	8	1	..	8	..	..	..	4	..	..	1	1	1	2	1	1	1	1	1	..	..	100	..	..
Indiana	131	..	..	..	5	1	..	..	1	1	2	..	28	..	3	..	14	3	1	6	1	3	2	1	20	..	3	..	2	..	..	..	2	1	14	..	..	4	..	1	..	3	2	1	1	2	..	1	2	..	..	....	..	..
Iowa	74	..	..	..	3	..	1	..	..	..	..	..	10	1	..	5	1	2	1	1	1	2	4	..	7	..	8	..	..	..	..	..	..	..	1	..	..	1	..	..	3	..	..	19	..	1
Kansas	51	1	..	1	..	3	1	..	..	..	..	..	3	2	2	..	1	..	1	1	1	2	1	1	4	..	2	..	..	..	..	..	1	..	3	2	..	8	1	..	4	..	1	..	3	2	1	1	2	..	1	2	..	..	12	..	..
Kentucky	90	..	..	4	1	2	..	..	1	..	1	..	5	2	..	..	..	1	..	2	..	..	2	3	3	..	..	..	..	1	..	5	2	..	8	1	..	4	..	1	..	17	2	..	..	7	..	1	2	..	..	12	..	..
Louisiana	133	9	..	10	5	..	..	..	1	..	14	..	5	..	2	3	1	..	..	4	..	3	3	15	3	..	1	..	..	..	..	2	2	..	9	3	..	1	..	..	..	14	17	1	..	2	..	..	3	..	..	....	..	..
Maine	44	..	..	..	1	..	1	..	..	..	..	..	..	1	1	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	1	..	..	..	1	..	..	1	..	..	30	..	..
Maryland	193	1	..	1	2	..	1	..	12	..	4	..	5	1	..	2	4	3	..	..	1	3	2	..	4	1	2	..	1	3	..	8	2	..	1	2	..	12	1	1	..	5	2	..	..	9	..	..	1	..	..	96	..	..
Massachusetts	334	1	..	..	..	..	..	..	..	..	1	..	..	2	..	1	1	2	2	2	..	..	..	1	2	..	..	..	3	1	..	4	7	..	6	1	..	6	5	..	..	1	4	1	4	2	..	..	1	..	..	273	..	..
Michigan	203	..	..	2	4	5	..	1	2	..	4	..	21	11	10	2	3	6	1	10	..	..	7	..	8	..	4	..	..	1	..	8	..	..	20	4	2	13	3	1	..	4	7	..	..	3	1	..	5	..	..	30	..	..
Minnesota	140	..	..	2	7	1	..	..	..	..	1	..	1	2	2	3	2	3	..	1	..	3	..	..	4	..	8	..	..	..	..	..	1	..	1	1	..	4	1	..	..	1	1	..	..	1	..	..	..	..	..	....	..	..
Mississippi	66	..	..	2	3	..	1	..	2	..	1	..	5	1	..	..	1	3	..	1	..	1	..	..	1	..	..	..	..	..	..	..	1	..	1	3	2	8	..	..	1	5	7	..	1	1	2	..	4	..	..	64	..	..
Missouri	121	..	..	10	2	2	..	..	..	..	1	1	5	2	5	23	2	5	..	..	2	4	3	2	..	..	3	..	..	..	..	3	..	..	2	1	1	1	..	..	1	4	4	..	..	2	..	..	..	..	..	4	..	2
Montana	59	..	..	..	5	1	1	..	..	1	..	1	5	1	..	2	..	..	..	1	..	4	4	..	3	..	7	..	..	..	..	1	..	1	2	1	2	3	..	..	..	..	..	1	1	..	2	..	1	..	..	8	..	..
Nebraska	19	..	..	..	1	1	..	..	..	..	..	..	3	1	2	3	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	....	..	..
Nevada	19	1	..	1	3	..	..	..	..	..	..	1	1	..	1	1	..	..	..	1	..	1	1	..	..	..	..	..	..	1	..	1	1	..	..	..	..	1	..	..	..	..	1	..	..	1	..	..	..	..	..	....	..	..
New Hampshire	38	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	....	..	..
New Jersey	277	1	..	1	1	..	1	..	3	..	2	..	2	1	..	..	4	1	..	9	..	1	1	..	3	..	1	..	51	1	..	8	..	..	3	..	..	40	2	..	..	1	1	..	1	4	..	..	1	..	..	135	..	..
New Mexico	42	1	..	..	4	3	..	..	..	..	..	..	5	..	..	1	2	2	..	..	..	1	2	..	..	..	..	..	..	..	3	..	..	..	4	3	..	3	..	..	..	2	4	..	..	..	1	..	..	..	..	1	..	..
New York	1,044	2	..	..	17	3	..	..	3	..	..	..	2	5	2	..	..	9	1	12	2	12	7	..	2	..	1	..	..	8	..	..	1	..	6	..	3	31	..	..	..	6	6	..	3	12	..	..	10	..	..	861	13	4
North Carolina	75	1	..	1	1	..	..	..	1	1	1	..	1	..	..	1	3	1	..	5	2	2	..	1	6	..	2	..	..	1	..	3	..	..	3	..	..	9	..	11	..	1	..	..	..	15	..	..	..	..	..	2	..	..
North Dakota	17	..	..	1	1	1	..	..	..	..	..	..	2	..	1	..	..	..	..	..	..	1	..	..	..	..	2	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	..	..
Ohio	391	..	..	3	7	2	1	..	1	2	5	..	30	13	5	4	10	7	2	25	2	26	7	2	29	1	5	..	..	2	..	20	5	..	..	1	..	17	1	2	..	9	..	2	2	13	..	5	10	..	..	112	1	..
Oregon	93	..	..	..	11	4	..	..	..	..	..	1	3	1	5	1	..	1	..	1	..	..	11	..	7	..	3	..	..	..	..	1	..	1	2	2	..	2	..	..	..	1	1	1	..	3	..	5	..	..	25	..	..
Pennsylvania	213	..	..	1	10	1	1	1	..	1	3	..	7	2	2	1	2	3	1	15	1	6	1	1	7	..	1	..	1	6	..	7	8	..	11	..	..	..	..	2	..	5	2	1	1	2	..	2	1	..	2	91	3	..
Rhode Island	21	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	18	..	..
South Carolina	60	..	..	1	..	..	..	..	..	..	8	..	..	2	..	..	2	4	..	2	..	..	..	..	..	..	..	..	..	..	..	..	11	..	1	2	..	3	..	..	..	3	..	..	..	5	..	..	..	..	..	16	..	..
South Dakota	23	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	1	..	..	..	..	1	5	..	1	..	2	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	6	..	..
Tennessee	87	2	..	8	4	..	..	..	..	..	6	..	2	..	..	..	6	4	..	1	..	2	1	9	3	..	..	..	..	..	..	2	4	..	1	..	..	1	2	..	..	7	..	1	1	..	..	19	..	..
Texas	209	2	1	10	9	2	..	..	1	1	7	1	15	10	1	3	9	24	1	5	3	3	7	1	15	..	4	..	1	1	..	4	6	..	14	11	..	7	1	1	..	13	..	..	1	5	1	1	1	..	6	....	..	..
Utah	38	..	..	1	5	1	..	..	..	..	..	..	3	..	..	1	..	..	..	1	..	1	..	..	..	3	2	..	..	2	..	1	1	..	..	..	..	1	..	..	..	2	..	..	..	..	..	..	..	1	2	10	..	..
Vermont	32	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	26	..	..
Virginia	136	..	..	2	4	..	1	1	3	..	4	..	..	1	2	1	2	2	..	14	..	2	5	1	3	..	3	..	..	..	..	2	17	..	2	1	1	11	..	3	..	3	1	..	..	..	2	2	..	..	40	..	..
Washington	146	1	..	1	18	4	1	..	..	..	1	2	9	1	3	3	1	2	..	1	2	2	12	1	10	1	2	..	..	..	..	1	..	..	9	..	7	2	..	..	1	..	1	..	..	..	3	..	..	1	..	..	38	..	5
West Virginia	73	1	..	1	..	..	..	..	2	..	..	..	1	1	..	..	3	..	1	5	..	1	..	..	1	..	..	..	..	..	..	..	1	..	7	3	..	8	..	1	..	1	..	1	..	13	..	..	..	..	..	14	..	..
Wisconsin	104	..	..	..	3	1	..	..	..	..	1	..	19	4	1	..	2	..	..	3	..	6	12	..	7	..	2	..	1	..	..	..	..	..	1	1	1	1	..	..	..	1	1	..	1	1	..	..	..	..	15	19	..	..
Wyoming	19	..	..	..	2	3	..	..	..	..	..	..	2	1	1	1	..	..	..	..	..	..	2	..	1	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	3	..	..
Alaska, Canal Zone, Guam, Hawaii, and Puerto Rico	58	1	..	..	1	1	1	..	..	..	..	..	1	1	1	2	2	..	..	3	..	..	..	..	2	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	1	..	..	2	1	..	..	..	..	..	35	..	1
Totals	7,461	29	5	80	178	77	18	5	46	11	98	11	359	125	112	117	109	149	19	217	32	170	201	53	281	10	122	2	11	44	3	207	104	10	268	63	44	286	17	43	10	201	124	27	24	149	46	20	105	1	48	2,922	29	19
Marginal Number.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54

communication with the licensing boards. A list of the executive officers in charge of medical licensure appears elsewhere in this study.

The procedure in issuing licenses by reciprocity or endorsement varies. Some states entertain applications for licensure at any time, while others hold monthly, quarterly, or semiannual meetings. The policy in effect in each state is contained in table 24 (page 361). In addition, THE JOURNAL publishes biweekly the exact dates when reciprocity or endorsement applications are considered.

The credentials presented by physicians granted licenses to practice medicine without written examination are given in table 9. There were 7,461 so registered on the basis of licenses from other states, the District of Columbia, the territories or outlying possessions of the United States, Canada and foreign countries, the certificate of the National Board of Medical Examiners, by special exemption, and by acceptance of service with an agency of the government of the United States. California issued the greatest number of licenses by this method. In this state 1,415 were registered. New York licensed 1,044 by this method. Figures for other states were fewer than 400. Ten states licensed more than 200.

The largest number of candidates who presented the same type of credentials were the 2,922 diplomates certified by the National Board of Medical Examiners. On the basis of the certificate of the National Board, 861 were licensed in New York, 403 in California, 273 in Massachusetts, and 168 in Connecticut. Other states registered fewer than 150. None were licensed on this basis in Arkansas, Florida, Indiana, Louisiana, Nebraska, Nevada, and Texas.

There were 359 licenses issued in Illinois, 286 in Pennsylvania, and 281 in Missouri presented to other states for reciprocal registration. More than 200 licenses from California, Maryland, Minnesota, New York, Ohio, and Tennessee were endorsed for reciprocal licensure. Licenses from every state were used as the basis for registration by this method, ranging from 2 licenses from Nevada to 359 from Illinois.

Seven states registered 48 physicians by endorsement of credentials from one of the government services. Twenty-nine physicians were licensed in five states on the basis of a license issued in Alaska, the Canal Zone, Hawaii, and Puerto Rico; 19 physicians in 7 states on the basis of Canadian or foreign credentials.

Table 10 records the number of individual schools represented by the 7,461 reciprocity licentiates. Every approved medical school in the United States and 9 of the 11 approved medical schools of Canada had graduates licensed without written examination in 1955. The 7,461 physicians registered without written examination in the United States in 1955 included 7,062 graduates of approved medical schools in the United States. There were 292 graduates of Harvard, 247 from New York University, and 233 from the State University of New York at New York City licensed by reciprocity. In addition, 100 or more graduates of 28 other schools secured such licenses. This table reflects the movement of physicians to states other than the ones in which they obtained their professional training or in which they first established their practice.

One hundred sixty-eight foreign-trained physicians obtained licenses by reciprocity or endorsement in 22 states, and 39 graduates of approved medical schools no longer in operation were registered by 20 states. Twenty-seven graduates of unapproved medical schools secured licenses in 8 states, and 58 graduates of schools of osteopathy were registered to practice medicine, surgery, or both, in 12 states. There were 292 represented in these four groups. There were 107 graduates of Canadian medical schools registered by 29 boards.

Licentiates Representing Additions to the Medical Profession

Figures for the number of physicians who secured their first license to practice medicine and surgery in 1955 and who therefore represent additions to the medical profession in the United States and its territories and outlying possessions are presented in tables 11 and 12. Included in these compilations are figures pertaining to candidates examined and licensed in 1955, candidates who were examined in previous years but to whom licenses were not issued until 1955 pending completion of a required internship, citizenship, or other technicalities, and physicians not previously licensed in any state who were certified during the year on the basis of the certificate of the National Board of Medical Examiners. The figures also include physicians licensed on the basis of government credentials and Canadian and foreign licenses. The majority represent recent graduates.

These official figures indicate that 7,737 persons were added to the physician population in 1955 in the United States, Alaska, the Canal Zone, Guam, Hawaii, Puerto Rico, and the Virgin Islands. By reference to table 1, it can be noted that 14,840 licenses were issued during the year, indicating that 7,103 had previously been licensed. In 1955 there were about 4,000 deaths of physicians reported to the office of the American Medical Association. When this figure is deducted from the number licensed in 1955 for the first time, it will be seen that the net increase in the physician population in the United States and its territories and possessions was about 3,800.

In analyzing table 11, it can be noted that New York had the greatest number of first licentiates, 893. Five states added more than 375 to their physician population; namely California 669, Ohio 589, Pennsylvania 516, Illinois 398, and Texas 389. Increases as compared with 1954 [2] occurred in 15 states.

The 7,737 licentiates representing additions to the medical profession in the last calendar year included 6,211 who secured their licenses by written examination and 1,526 by endorsement of credentials. The latter were mainly physicians certified by the National Board of Medical Examiners.

Increases in the physician population arranged in nine geographical divisions in the United States are shown in table 13. The East North Central, Middle Atlantic, and South Atlantic groups had the greatest number of first licentiates—1,584, 1,506, and 1,144 respectively. More than 500 were added in four other groups: West North Central, 843; West South Central, 782; Pacific, 779; and East South Central, 576. The New England states added 422, the Mountain states 157, and the territories and outlying possessions 77.

2. J. A. M. A. 158: 281 (May 28) 1955.

Marginal Number	SCHOOL	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine
	ALABAMA																		
1	Medical College of Alabama, Birmingham	3	..	..	1	..	..	..	..	..	1	..	1	1	..	1	..	7	..
	ARKANSAS																		
2	University of Arkansas School of Medicine, Little Rock	4	1	..	9	..	..	..	..	..	..	..	..	1	1	1	4	10	..
	CALIFORNIA																		
3	College of Medical Evangelists, Loma Linda-Los Angeles	..	2	..	15	6	1	..	3	..	2	4	..	4	3	2	2	1	1
4	University of Southern California School of Medicine, Los Angeles	..	1	..	3	..	1	..	..	..	..	..	..	..	..	..	..	2	..
5	Stanford University School of Medicine, San Francisco	..	1	..	5	1	1	..	..	..	.	2	..	..	..	..	1	1	..
6	University of California School of Medicine, San Francisco	..	..	..	2	..	..	..	..	..	..	2	..	..	..	..	..	..	..
7	University of California School of Medicine, Los Angeles	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	COLORADO																		
8	University of Colorado School of Medicine, Denver	1	1	1	23	4	..	..	1	..	..	..	2	1	..	2	1	..	..
	CONNECTICUT																		
9	Yale University School of Medicine, New Haven	..	1	..	19	2	28	..	1	..	..	1	2	1	2	2	..	..	1
	DISTRICT OF COLUMBIA																		
10	Georgetown University School of Medicine	1	..	..	15	..	7	..	21	..	..	..	3	1	..	..	..	1	2
11	George Washington University School of Medicine	..	1	..	32	2	4	2	3	..	2	2	2	..	2	1	1	..	1
12	Howard University College of Medicine	1	..	1	20	..	3	..	13	..	..	..	1	4	..	..	1	1	..
	GEORGIA																		
13	Emory University School of Medicine, Atlanta	7	..	..	5	1	..	..	3	..	1	..	..	1	..	..	1	5	..
14	Medical College of Georgia, Augusta	5	1	..	6	..	1	..	1	..	..	..	..	..	..	..	..	6	..
	ILLINOIS																		
15	Chicago Medical School	..	..	..	16	1	2	..	..	..	1	..	3	1	..	..	2	..	..
16	Northwestern University Medical School, Chicago	1	4	..	57	2	1	..	2	..	1	1	10	7	3	2	1	3	..
17	Stritch School of Medicine of Loyola University, Chicago	..	1	..	20	..	2	..	1	..	..	..	10	3	3	1	1	1	..
18	University of Chicago, The School of Medicine	..	1	1	25	..	..	..	2	..	..	3	14	2	1	..	2	3	..
19	University of Illinois College of Medicine, Chicago	3	5	1	68	4	2	..	..	..	1	1	21	13	6	2	2	1	..
	INDIANA																		
20	Indiana University School of Medicine, Bloomington-Indianapolis	1	..	..	41	1	..	..	2	..	2	..	4	..	1	2	..	..	..
	IOWA																		
21	State University of Iowa College of Medicine, Iowa City	..	3	..	37	5	1	..	1	..	..	..	6	2	5	2	..	1	..
	KANSAS																		
22	University of Kansas School of Medicine, Lawrence-Kansas City	1	1	..	26	4	..	..	..	..	..	..	2	..	5	..	..	1	..
	KENTUCKY																		
23	University of Louisville School of Medicine, Louisville	2	..	..	12	3	..	..	..	..	5	1	3	11	1	..	1	1	..
	LOUISIANA																		
24	Louisiana State University School of Medicine, New Orleans	3	..	1	6	..	1	..	1	..	1	..	..	2	1	..	..	4	..
25	Tulane University School of Medicine, New Orleans	5	..	1	12	2	..	..	1	..	9	..	5	2	1	..	2	7	..
	MARYLAND																		
26	Johns Hopkins University School of Medicine, Baltimore	3	1	2	17	2	5	1	9	..	5	..	2	3	1	..	..	1	2
27	University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore	1	..	..	10	..	2	2	4	..	4	1	2	1	..	1	..	1	..
	MASSACHUSETTS																		
28	Boston University School of Medicine	..	..	..	8	1	10	..	2	..	..	..	3	..	1	1	..	..	1
29	Harvard Medical School, Boston	3	..	..	89	2	11	1	4	..	2	..	5	..	1	2	4	1	7
30	Tufts College Medical School, Boston	..	..	..	14	..	10	1	3	..	1	1	4	1	1	1	..	..	10
	MICHIGAN																		
31	University of Michigan Medical School, Ann Arbor	..	3	..	35	3	1	1	2	..	1	..	6	2	2	1	..	1	..
32	Wayne University College of Medicine, Detroit	..	1	..	12	2	..	..	..	..	..	..	3	..	..	..	..	1	..
	MINNESOTA																		
33	University of Minnesota Medical School, Minneapolis	..	3	..	57	8	..	..	2	..	..	1	..	1	3	..	2	3	..
	MISSOURI																		
34	St. Louis University School of Medicine	..	1	1	48	4	2	..	1	..	..	2	6	7	2	1	1	2	..
35	Washington University School of Medicine, St. Louis	1	..	1	29	5	3	..	..	..	2	..	6	2	4	2	2	..	..
	NEBRASKA																		
36	Creighton University School of Medicine, Omaha	1	2	..	25	3	..	..	..	..	..	..	1	..	4	2	..	2	..
37	University of Nebraska College of Medicine, Omaha	..	1	1	36	6	..	..	1	..	..	..	6	3	6	3	2	1	..
	NEW YORK																		
38	Albany Medical College	..	..	..	8	..	3	2	..	..	..	..	3	..	2	..	..	..	..
39	University of Buffalo School of Medicine	1	..	..	12	1	2	..	1	..	..	..	4	1	..	..	1	..	..
40	Columbia University College of Physicians and Surgeons, New York	..	2	..	21	1	12	..	3	..	1	..	2	1	..	1	2	..	2
41	Cornell University Medical College, New York	..	..	..	10	3	8	..	3	..	1	..	2	..	2	1	2	..	..
42	New York Medical College, Flower and Fifth Avenue Hospitals	2	..	..	26	..	8	..	3	..	1	..	4	1	1	..	1	..	..
43	New York University College of Medicine	1	..	..	33	2	16	1	4	..	..	..	2	..	..	2	1	1	1
44	State University of New York College of Medicine, New York City	1	1	..	21	..	27	..	2	..	2	..	5	..	..	..	..	..	1
45	University of Rochester School of Medicine and Dentistry	..	..	..	19	3	4	1	..	..	..	..	5	..	..	1	1	..	3
46	State University of New York College of Medicine, Syracuse	..	..	..	5	..	3	..	2	..	..	..	1	..	..	..	..	..	..
	NORTH CAROLINA																		
47	Duke University School of Medicine, Durham	1	..	..	7	1	2	..	2	..	3	..	3	..	..	..	2	1	..
48	Bowman Gray School of Medicine of Wake Forest College, Winston-Salem	1	1	..	7	..	..	..	..	..	5	..	..	1	..	..	1	2	..
49	University of North Carolina School of Medicine, Chapel Hill	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	OHIO																		
50	University of Cincinnati College of Medicine	1	2	..	28	2	1	..	..	..	1	1	5	6	..	..	5	4	..
51	Western Reserve University School of Medicine, Cleveland	..	3	..	17	4	3	..	..	..	1	1	..	1	1	2	1	4	3
52	Ohio State University College of Medicine, Columbus	2	2	..	26	1	2	..	..	..	1	..	3	6	..	1	1	2	..
	OKLAHOMA																		
53	University of Oklahoma School of Medicine, Oklahoma City	1	2	..	16	3	1	..	..	..	..	..	1	..	..	2	1	3	..
	OREGON																		
54	University of Oregon Medical School, Portland	..	..	..	33	1	1	..	..	..	1	2	1	..	..	..	..	..	..
	Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico, Canal Zone, and Guam	Totals	Marginal Number
..	..	..	..	..	..	..	..	1	..	1	..	1	1	..	..	..	..	..	..	..	..	1	1	..	..	..	1	1	..	..	1	24	1
1	1	2	2	2	10	..	..	1	..	2	..	1	1	1	3	1	..	1	..	1	..	8	9	1	..	2	1	1	..	..	..	83	2
4	1	3	..	..	1	5	..	1	1	1	3	1	1	..	3	1	13	..	..	..	..	6	3	1	..	3	9	1	1	1	1	111	3
..	..	..	..	..	1	..	..	1	..	..	1	4	..	..	2	1	1	..	..	..	..	..	..	3	..	..	..	1	..	..	..	24	4
..	..	..	..	..	..	2	..	..	..	1	1	5	..	..	..	..	1	..	..	..	..	1	1	..	..	2	3	..	..	..	..	33	5
1	..	..	..	3	..	..	..	..	..	..	..	5	..	..	..	1	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	21	6
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	7
1	..	4	..	..	3	..	1	..	..	..	3	3	..	1	3	..	4	1	1	..	..	..	2	1	..	..	4	..	2	3	1	75	8
3	6	3	3	..	1	..	..	..	1	1	..	16	..	..	8	1	..	3	1	..	..	2	1	1	..	..	2	1	..	..	1	115	9
26	15	1	3	..	1	..	..	..	1	17	..	27	..	..	4	..	1	6	..	1	..	1	..	..	..	8	3	2	1	..	..	172	10
29	1	..	4	..	..	..	..	2	..	5	..	5	1	..	8	1	1	5	..	..	1	3	5	2	..	10	3	3	..	..	..	169	11
3	1	6	..	3	..	..	..	..	..	4	..	12	..	..	8	1	..	9	..	..	..	..	2	..	..	3	..	..	1	..	..	98	12
..	1	1	..	1	1	..	..	..	..	..	..	..	1	..	2	1	..	1	..	1	..	4	3	..	..	1	..	..	1	..	..	43	13
2	2	1	1	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	6	..	3	1	..	..	2	..	..	..	..	..	40	14
..	..	..	..	..	2	..	..	..	..	7	..	31	..	..	3	..	..	1	..	..	..	1	..	..	1	..	..	1	..	..	..	76	15
1	2	7	2	2	3	2	1	..	..	1	..	5	1	1	8	2	3	2	..	..	2	1	4	1	..	2	6	1	5	2	1	153	16
1	1	5	2	..	2	1	..	..	..	1	1	4	..	..	6	..	..	..	..	..	..	..	3	..	..	..	..	..	6	..	1	77	17
1	..	4	1	..	1	3	..	..	..	3	1	6	..	1	1	1	1	4	..	..	..	1	1	..	..	..	5	..	1	2	..	92	18
1	..	10	3	1	2	3	..	2	..	1	..	4	..	..	6	1	2	2	..	..	2	..	6	1	..	..	4	..	11	1	1	104	19
1	2	6	2	1	2	1	1	..	..	1	..	4	..	..	10	1	..	2	..	1	..	..	10	..	..	1	1	1	2	1	1	106	20
..	..	9	3	2	4	1	..	1	..	..	..	3	..	1	4	2	4	1	..	..	1	1	1	..	..	3	2	..	2	1	1	110	21
2	1	1	3	..	20	2	2	2	..	..	1	2	1	..	4	3	..	1	..	..	..	..	3	1	..	1	4	..	..	1	2	97	22
5	..	3	2	1	2	..	..	..	..	5	2	2	1	..	10	3	..	4	..	2	1	6	4	..	..	2	1	2	3	..	2	103	23
2	1	3	1	5	2	..	..	1	..	1	..	..	1	..	1	..	1	1	..	4	..	1	11	..	..	..	2	..	..	..	..	58	24
1	3	2	2	8	2	..	..	..	..	..	1	9	..	..	3	1	1	2	1	..	1	4	13	..	..	..	..	..	1	..	..	102	25
3	2	4	3	1	1	1	..	..	..	6	1	11	1	..	11	1	..	8	..	2	..	2	1	1	1	3	..	3	2	..	..	123	26
3	1	3	1	..	..	..	..	1	..	1	..	9	3	1	12	..	2	5	..	1	..	..	1	3	..	6	..	2	1	..	2	87	27
1	31	..	..	..	1	..	..	..	5	5	..	18	..	..	7	..	2	3	1	..	..	..	..	1	1	..	2	1	..	..	2	108	28
10	80	3	7	..	1	3	1	..	3	3	..	46	4	1	7	2	1	12	2	2	..	..	1	1	2	6	2	1	4	..	2	292	29
2	56	3	..	..	1	1	..	..	3	3	..	18	..	..	..	..	1	2	8	..	..	1	1	..	1	..	1	1	..	..	1	151	30
1	1	2	3	1	2	3	..	1	..	1	..	9	1	1	19	1	..	5	..	..	1	1	6	1	..	..	2	..	1	..	..	121	31
..	..	..	..	..	..	..	..	..	..	..	..	4	1	..	2	..	..	..	..	..	..	1	..	..	..	1	..	1	1	..	1	31	32
1	1	4	1	..	3	2	1	1	..	..	1	7	..	..	5	1	7	1	..	..	2	..	8	..	..	1	7	..	8	..	..	142	33
1	1	6	4	..	1	1	..	..	..	2	..	4	2	..	24	2	1	3	..	..	..	1	4	1	..	1	5	1	1	..	..	144	34
3	1	3	2	1	2	1	..	..	..	1	..	5	2	..	3	2	6	4	..	1	1	1	9	..	..	4	6	..	6	..	7	128	35
..	..	3	3	..	5	3	4	..	1	..	..	1	..	1	1	1	1	1	..	..	..	..	1	..	..	..	2	..	..	1	..	69	36
2	..	2	8	..	3	6	1	..	..	1	..	1	2	1	8	..	3	1	..	..	2	..	3	2	..	3	2	..	2	2	..	121	37
2	2	..	1	..	2	1	..	1	..	2	..	44	..	1	1	1	..	2	..	..	..	..	..	..	..	3	1	..	1	..	..	83	38
1	2	2	3	..	..	1	..	..	..	3	..	50	..	..	5	..	2	7	..	1	..	..	..	..	..	..	..	1	1	..	..	102	39
5	21	2	4	..	5	1	..	..	1	8	2	71	3	..	11	1	1	3	1	..	..	3	..	1	1	2	1	2	..	..	1	199	40
1	5	2	2	..	..	3	..	..	1	11	..	47	1	..	4	..	1	4	..	..	1	..	..	..	3	2	2	2	1	1	..	126	41
3	5	1	3	..	2	..	..	..	..	21	..	59	..	..	5	..	1	7	2	..	..	..	..	..	..	..	1	..	..	..	3	160	42
8	6	5	1	1	1	..	..	1	1	29	..	112	..	1	8	1	..	2	..	..	..	2	..	2	..	1	..	1	..	..	1	247	43
5	4	2	1	..	1	..	..	..	2	20	..	119	..	..	3	..	1	5	1	..	..	2	..	1	1	2	..	3	..	..	..	233	44
4	5	2	5	2	..	..	..	..	1	1	..	56	2	..	8	..	1	4	1	..	..	..	3	1	3	..	6	..	2	..	1	125	45
..	4	..	1	..	..	..	..	..	1	..	..	48	1	..	1	..	1	2	..	..	..	..	..	1	..	..	..	..	..	..	..	71	46
2	4	2	2	1	2	..	..	..	..	..	..	18	3	..	4	..	..	3	..	7	..	3	3	..	..	5	..	3	2	1	2	89	47
1	2	..	..	..	..	..	..	..	..	1	..	1	1	..	1	..	..	..	..	6	..	1	2	1	..	6	..	1	..	..	..	42	48
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	3	49
..	3	3	..	1	1	1	..	..	..	..	2	5	1	1	..	1	..	3	..	1	..	..	3	..	..	2	2	2	2	..	..	99	50
..	3	6	1	..	..	1	..	..	..	..	2	3	2	..	1	..	2	4	..	2	1	1	4	..	..	..	3	1	1	..	..	79	51
1	1	7	..	..	1	1	1	..	..	..	..	3	..	..	..	..	..	1	..	..	..	..	3	..	..	1	2	3	1	..	..	73	52
2	1	4	3	..	2	1	1	..	..	..	3	..	..	..	1	9	3	..	..	2	1	..	11	..	..	1	..	..	1	..	..	76	53
..	1	..	2	..	1	2	..	1	..	1	..	2	..	..	1	..	12	3	..	..	..	..	..	1	..	1	10	..	..	1	1	79	54
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

Marginal Number	SCHOOL	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. of Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine
	Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	PENNSYLVANIA																		
55	Hahnemann Medical College and Hospital of Philadelphia	..	1	..	15	1	3	..	2	..	3	1	4	1	..	..	1	..	1
56	Jefferson Medical College of Philadelphia	1	1	..	25	1	9	..	2	..	4	..	5	2	1	1	..	1	..
57	Temple University School of Medicine, Philadelphia	..	3	1	18	5	8	..	2	..	7	..	3	2	1	3	1	..	..
58	University of Pennsylvania School of Medicine, Philadelphia	1	2	..	39	..	3	1	1	..	2	2	1	..	..	..	2	..	..
59	Woman's Medical College of Pennsylvania, Philadelphia	..	1	..	13	1	2	..	2	..	1	..	1	..	1	..	..	1	..
60	University of Pittsburgh School of Medicine	..	..	..	7	..	..	..	1	..	..	1	2	1	1	..	..	..	..
	SOUTH CAROLINA																		
61	Medical College of South Carolina, Charleston	..	1	2	8	..	1	..	1	..	5	..	..	1	..	..	..	1	..
	TENNESSEE																		
62	University of Tennessee College of Medicine, Memphis	11	2	8	19	3	1	..	..	..	3	1	2	5	..	1	17	11	..
63	Meharry Medical College, Nashville	4	..	1	15	..	..	..	2	..	..	..	3	3	..	..	..	3	..
64	Vanderbilt University School of Medicine, Nashville	10	1	6	11	..	..	..	1	..	4	..	..	..	..	..	1	1	..
	TEXAS																		
65	University of Texas Southwestern Medical School, Dallas	..	..	..	7	1	..	..	..	..	1	..	..	..	..	..	1	6	..
66	University of Texas School of Medicine, Galveston	..	..	1	11	1	.	..	..	..	1	1	1	..	..	..	..	6	..
67	Baylor University College of Medicine, Houston	2	1	..	15	..	..	..	..	..	.	..	..	2	..	..	1	7	..
	UTAH																		
68	University of Utah School of Medicine, Salt Lake City	..	1	..	14	2	..	..	..	..	1	1	..	..	..	..	..	1	..
	VERMONT																		
69	University of Vermont College of Medicine, Burlington	1	..	..	6	..	4	..	1	..	..	..	..	..	..	3	..	..	1
	VIRGINIA																		
70	University of Virginia School of Medicine, Charlottesville	4	1	..	7	2	2	..	2	..	..	..	2	2	..	1	5	2	..
71	Medical College of Virginia, Richmond	..	..	1	10	.	..	2	2	..	2	1	..	1	1	..	4	1	..
	WASHINGTON																		
72	University of Washington School of Medicine, Seattle	..	..	..	6	..	1	..	..	..	..	1	..	..	..	..	1	..	..
	WISCONSIN																		
73	University of Wisconsin Medical School, Madison	..	..	..	14	..	..	..	1	..	..	..	6	2	..	..	..	1	..
74	Marquette University School of Medicine, Milwaukee	..	1	1	29	1	1	..	..	..	..	2	1	1	..	..	1	1	..
	PUERTO RICO																		
75	University of Puerto Rico School of Medicine, San Juan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CANADA																		
76	University of Alberta Faculty of Medicine, Edmonton	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	University of British Columbia Faculty of Medicine, Vancouver	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78	University of Manitoba Faculty of Medicine, Winnipeg	..	..	..	3	..	..	..	..	..	.	..	..	..	..	..	..	..	..
79	Dalhousie University Faculty of Medicine, Halifax	..	..	..	3	..	..	..	1	..	..	..	1	..	..	..	..	..	..
80	Queen's University Faculty of Medicine, Kingston	..	..	..	3	..	..	..	..	..	1	..	..	..	..	..	..	..	..
81	University of Ottawa Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
82	University of Western Ontario Faculty of Medicine, London	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
83	University of Toronto Faculty of Medicine	..	..	..	6	..	..	..	1	..	..	..	1	1	..	..	..	..	..
84	McGill University Faculty of Medicine, Montreal	..	..	..	13	..	1	2	1	..	..	..	1	..	1	..	1	1	..
85	University of Montreal Faculty of Medicine	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..
86	Laval University Faculty of Medicine, Quebec	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	OTHERS																		
87	Foreign Medical Faculties	..	4	1	..	..	23	..	10	..	3	..	..	4	1	..	..	..	6
88	Extinct Medical Schools	..	3	..	5	1	..	..	..	..	..	..	1	..	..	..	2	..	..
89	Unapproved Medical Schools	..	..	..	15	..	..	1	..	..	..	..	4	..	1	..	..	..	1
90	Schools of Osteopathy	..	..	..	..	16	..	2	1	..	..	..	..	9	..	..	..	..	..
91	Totals	92	72	33	1,415	131	255	20	166	0	90	37	213	131	74	51	90	133	44
	Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

In the past 21 years (1935-1955), 135,164 physicians have been added to the medical profession, as determined by the number who received licenses for the first time. Figures for each year during this period are presented in table 13. Of the 135,164 additions, 113,190 were licensed after a successful written examination and 21,974 by reciprocity or endorsement of credentials. The total number of licenses issued in the same period was 237,613.

Registration of Physicians, 1904-1955

A recapitulation of totals for 1955 and for all previous years since 1904 is included in table 14. This tabulation includes for each year the number of physicians examined and registered by written examination, the annual percentage of failures, the number registered annually by reciprocity or endorsement of credentials, and the total registered. The total number of physicians registered from 1904 to 1933 remained somewhat constant, except in 1918, when 4,231 were licensed, the lowest registration in 52 years. This decrease was due to a sudden withdrawal of physicians from civilian life in World War I. After 1933 there was an upward trend for a time, followed by a decline in the years 1940 to 1943 inclusive. There was a noticeable increase in 1943 as the result of the accelerated medical school curriculum and the efforts made to maintain civilian care during World War II at as high a level as possible while still providing for the needs of the military. In 1943 more physicians were registered than in any previous year. In the succeeding two years the total figure declined, but in 1946 there were 6,696 more registered than in 1943. Separation from service of a large number of medical officers and their subsequent licensure by endorsement of credentials indicating their return to private practice in states other than those in which they were licensed accounts in large part for this increase. This increase was also occasioned by the licensure of recent graduates who had entered military service on completion of the internship and before securing state licensure.

In 1904, the first year shown, the percentage of failures was 19.3. This was an era of proprietary medical schools. Beginning in 1913 the percentage of failures

19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	
Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	Alaska, Hawaii, Puerto Rico, Canal Zone, and Guam	Totals	Marginal Number
3	3	1	1	..	..	..	..	..	..	13	2	17	..	..	6	..	..	11	..	..	..	..	2	..	..	1	..	1	1	..	5	100	55
3	5	2	5	1	1	1	..	..	1	19	..	16	1	1	4	..	..	14	1	3	..	..	4	..	1	12	..	5	4	..	1	158	56
3	3	7	4	..	..	1	1	..	..	10	1	16	3	..	8	1	3	9	..	2	2	1	3	..	1	4	..	2	1	..	2	136	57
4	4	12	2	2	3	..	..	..	..	14	2	9	3	1	8	2	..	14	..	..	..	2	1	..	..	2	..	..	1	..	..	131	58
3	1	..	2	..	..	..	..	..	..	2	..	4	1	..	3	..	..	2	..	..	..	..	..	1	1	1	..	..	1	..	1	46	59
5	2	2	1	1	..	1	..	..	..	2	..	6	..	..	7	..	..	3	..	1	..	..	..	..	1	1	2	..	..	..	..	48	60
1	..	1	..	..	..	..	..	..	..	..	..	1	6	..	2	..	..	..	..	..	..	..	1	..	..	2	..	1	..	..	..	35	61
3	2	2	4	8	3	..	..	..	..	1	2	..	..	..	3	2	..	..	..	2	..	8	10	..	..	3	..	1	1	..	..	142	62
3	..	1	..	1	2	..	..	..	..	2	..	6	3	..	8	3	..	5	..	..	..	3	5	..	..	6	1	..	..	..	1	81	63
2	..	1	1	8	3	..	..	..	..	1	1	4	..	..	4	1	..	1	..	1	..	1	2	..	..	..	..	..	..	..	..	66	64
..	1	2	..	..	2	..	1	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	1	..	..	1	..	1	..	..	28	65
2	..	3	6	..	1	..	..	..	..	1	2	4	..	..	..	1	1	1	..	..	..	2	1	1	..	..	..	..	..	..	..	48	66
..	1	1	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	34	67
..	1	..	2	..	1	2	..	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	6	..	..	2	1	..	..	..	38	68
..	12	..	1	..	1	1	..	..	4	3	1	8	..	1	2	1	..	3	..	1	..	1	1	..	9	..	..	1	..	..	1	68	69
3	3	2	1	1	1	..	1	..	..	3	..	11	7	..	5	..	..	2	..	3	..	3	1	..	..	1	3	5	..	..	..	86	70
5	1	1	2	2	1	..	..	..	..	..	..	2	9	..	9	..	..	..	..	4	..	3	4	..	..	6	..	9	1	..	2	86	71
..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	7	..	..	1	20	72
..	..	2	3	..	..	..	1	.	..	1	..	4	..	..	6	1	5	..	..	1	1	1	1	..	..	2	3	..	5	..	1	62	73
1	1	2	3	..	2	..	..	..	..	1	1	5	..	..	3	1	1	..	..	..	2	..	1	..	..	1	2	..	7	..	5	78	74
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	* ..	..	..	..	0	75
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	3	76
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	77
..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	1	..	..	8	78
..	1	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	10	79
1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	7	80
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	81
..	..	1	1	..	..	..	.	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	8	82
1	..	..	..	..	..	..	1	..	..	..	..	4	..	..	2	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	19	83
1	3	1	..	..	..	..	..	..	3	1	1	9	1	1	2	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	46	84
..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	85
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	86
..	2	17	..	..	..	..	..	..	3	22	1	7	2	..	47	1	..	..	1	..	..	..	3	..	3	..	6	..	1	..	..	168	87
2	..	..	..	2	1	..	..	..	..	2	3	2	..	..	3	..	..	1	..	..	..	1	5	1	1	1	1	1	..	..	..	39	88
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	3	..	..	..	..	..	1	..	..	27	89
..	5	..	..	..	..	..	..	..	3	7	..	1	..	..	2	..	..	..	..	..	..	..	10	..	..	..	..	..	1	1	..	58	90
193	334	263	140	66	121	59	19	19	38	277	42	1,044	75	17	231	64	93	213	21	69	23	87	209	38	32	126	176	73	104	19	58	7,461	91
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	

gradually dropped each year until 1930, when 5.7% failed. Beginning in 1936 the percentage of failures began to rise, reaching another peak of 20.7% in 1940. This was the result of the increase in the number of foreign-trained physicians seeking licensure in the United States, many of whom are not successful after repeated attempts at licensure examinations. Since 1942 the percentage of failures has been somewhat reduced, although it still reflects the unsuccessful attempts of foreign-trained physicians, graduates of unapproved medical schools, and others.

This table again refers to examinations given annually rather than to individuals examined. A candidate who fails more than once in a state in a given year is counted as one failure, but should he again fail in a succeeding year this fact is computed among the failures for that year. Likewise, a successful candidate securing a license in more than one state in a given year is counted in both states and likewise counted if he passed at examination in later years. The figures in this table give only a fair approximation of the number of physicians added to the profession.

Graduates of Approved Schools and Others Registered, 1922-1955

Table 15 reflects for two categories the number of physicians registered since 1922. While prior to 1928 medical schools were classified by the Council as A, B, and C, for purposes of this table the schools are arranged in two groups. The figures in the first group include graduates of medical schools rated in class A and B prior to 1928 and schools classified as approved institutions in 1928. The second group refers to class C graduates, graduates of medical schools classified as unapproved since 1928, graduates of foreign medical faculties, and graduates of schools of osteopathy given recognition by medical licensing boards. In 1928, the classification of medical schools in A, B, and C groups was discontinued by the Council on Medical Education and Hospitals, and a list of approved medical schools has since been maintained.

In 1954 there were 14,861 candidates registered, of whom 13,344 or 89.8%, represented graduates of ap-

proved schools and 1,517, or 10.2%, were in the second group. In the 34 years recorded in this table, 330,708 were registered, including 298,270 approved graduates (87.2%) and 32,438 others (9.5%).

TABLE 11.—*Licentiates Representing Additions to the Medical Profession, 1955*

	Examination	Reciprocity and Endorsement	Total
Alabama	61	6	67
Arizona	4	1	5
Arkansas	82	0	82
California	532	137	669
Colorado	94	7	101
Connecticut	24	76	100
Delaware	14	0	14
District of Columbia	5	47	52
Florida	100	0	100
Georgia	201	0	201
Idaho	1	0	1
Illinois	363	35	398
Indiana	161	2	163
Iowa	115	5	120
Kansas	137	3	140
Kentucky	107	1	108
Louisiana	241	0	241
Maine	47	15	62
Maryland	263	28	291
Massachusetts	13	176	189
Michigan	289	9	298
Minnesota	193	33	226
Mississippi	72	0	72
Missouri	233	11	244
Montana	9	0	9
Nebraska	92	0	92
Nevada	1	0	1
New Hampshire	6	5	11
New Jersey	55	42	97
New Mexico	7	0	7
New York	190	703	893
North Carolina	192	1	193
North Dakota	9	3	12
Ohio	544	45	589
Oklahoma	69	1	70
Oregon	27	5	32
Pennsylvania	488	28	516
Rhode Island	32	10	42
South Carolina	68	2	70
South Dakota	5	4	9
Tennessee	189	7	196
Texas	386	3	389
Utah	23	7	30
Vermont	4	14	18
Virginia	189	9	198
Washington	61	17	78
West Virginia	20	5	25
Wisconsin	133	3	136
Wyoming	3	0	3
Alaska	3	1	4
Canal Zone	0	1	1
Guam	0	1	1
Hawaii	15	6	21
Puerto Rico	38	11	49
Virgin Islands	1	0	1
Totals	6,211	1,526	7,737

Graduates of Unapproved Medical Schools Registered, 1951-1955

Graduates of institutions that were classified by the Council on Medical Education and Hospitals of the American Medical Association as unapproved were registered in 26 states and the territories and outlying possessions in the past five years. Figures are reported separately in table 16 for those licensed after written examination and those licensed by reciprocity or endorsement of credentials. The table also includes a column combining the figures for these two groups. In the main they represent five schools more recently in operation. At present there is no medical school in complete operation that is not approved by the Council.

There were 262 graduates of unapproved medical schools registered in the five-year period 1951-1955, 94 by examination and 168 by endorsement of credentials. In 1955 there were 14 licensed in 6 states by examination and 168 licensed in 19 states by reciprocity or endorsement of credentials. California, Florida, Massachusetts, New York, and Texas licensed the greatest number of graduates of unapproved medical schools during this five-year period. In the remainder of the states shown there were fewer than eight registered.

TABLE 12.—*Licentiates Representing Additions to the Medical Profession Grouped in Geographical Divisions, 1955*

	Examination	Reciprocity and Endorsement	Total
New England			
Maine	47	15	62
New Hampshire	6	5	11
Vermont	4	14	18
Massachusetts	13	176	189
Rhode Island	32	10	42
Connecticut	24	76	100
Totals	126	296	422
Middle Atlantic			
New York	190	703	893
New Jersey	55	42	97
Pennsylvania	488	28	516
Totals	733	773	1,506
East North Central			
Ohio	544	45	589
Indiana	161	2	163
Illinois	363	35	398
Michigan	289	9	298
Wisconsin	133	3	136
Totals	1,490	94	1,584
West North Central			
Minnesota	193	33	226
Iowa	115	5	120
Missouri	233	11	244
North Dakota	9	3	12
South Dakota	5	4	9
Nebraska	92	0	92
Kansas	137	3	140
Totals	784	59	843
South Atlantic			
Delaware	14	0	14
Maryland	263	28	291
District of Columbia	5	47	52
Virginia	189	9	198
West Virginia	20	5	25
North Carolina	192	1	193
South Carolina	68	2	70
Georgia	201	0	201
Florida	100	0	100
Totals	1,052	92	1,144
East South Central			
Kentucky	241	0	241
Tennessee	189	7	196
Alabama	61	6	67
Mississippi	72	0	72
Totals	563	13	576
West South Central			
Arkansas	82	0	82
Louisiana	241	0	241
Oklahoma	69	1	70
Texas	386	3	389
Totals	778	4	782
Mountain			
Montana	9	0	9
Idaho	1	0	1
Wyoming	3	0	3
Colorado	94	7	101
New Mexico	7	0	7
Arizona	4	1	5
Utah	23	7	30
Nevada	1	0	1
Totals	142	15	157
Pacific			
Washington	61	17	78
Oregon	27	5	32
California	532	137	669
Totals	620	159	779
Territories and Possessions			
Alaska, Canal Zone, Guam, Hawaii, Puerto Rico, and Virgin Islands	57	20	77
Totals	6,211	1,526	7,737

Graduates of Schools of Osteopathy Registered by Medical Examining Boards, 1951-1955

The number of graduates of schools of osteopathy granted the privilege of practicing medicine or surgery or both by 17 medical examining boards for five years (1951-1955) is given in table 17. There have been 1,265 such persons registered, 916 by examination and 349 without written examination. In 1955 there were 291 so registered, 233 by examination and 58 by reciprocity. Following is a summary of the actions and regulations of the 17 boards providing for the licensing of osteopaths by the medical examining board.

In Colorado an osteopath receives a license to practice medicine. In Connecticut any registered osteopath may obtain the right to practice medicine or surgery or both according to the type of examination taken. Osteopaths in Delaware may be licensed as osteopathic physicians after successfully passing an examination in selected subjects. The District of Columbia will permit any person engaged in the practice of osteopathy on or before Jan. 1, 1928, to file application for a license to practice osteopathy and surgery. By recent court order in Illinois graduates of the Chicago College of Osteopathy are examined and may receive medical licenses. Under an amendment to the medical practice act in 1945, osteopaths in Indiana are permitted to practice medicine and surgery. Persons who were licensed in osteopathy before 1945 are authorized to practice osteopathy, surgery, and obstetrics.

In Massachusetts, the medical practice act by definition includes osteopathy in the practice of medicine and does no differentiate the type of license issued to an osteopathic physician. In New Hampshire osteopaths are granted the right to practice medicine and surgery.

New Jersey provides that osteopaths licensed prior to Nov. 1, 1941, who have served for a period of two years as an intern or resident surgeon in an approved osteopathic or medical hospital, or have completed a postgraduate course of two years in a college of osteopathy or medicine approved by the board, or have had at least three years of practice in a hospital approved by the board, can be admitted to an examination in pharmacology, therapeutics, and surgery. If successful, they can obtain a license to practice medicine and surgery.

TABLE 13.—*Licentiates Representing Additions to the Medical Profession, 1935-1955*

Year	Examination	Reciprocity and Endorsement	Total
1935	5,099	411	5,510
1936	5,548	629	6,177
1937	5,812	612	6,424
1938	5,759	501	6,260
1939	5,584	460	6,044
1940	5,432	455	5,887
1941	5,241	474	5,715
1942	5,560	454	6,014
1943	5,586	372	5,958
1944	6,495	470	6,695
1945	4,979	769	5,748
1946	5,362	1,608	6,970
1947	5,273	1,617	6,890
1948	4,942	1,694	6,636
1949	4,260	1,616	5,876
1950	4,609	1,393	6,002
1951	4,985	1,288	6,273
1952	5,168	1,717	6,885
1953	5,388	1,888	7,276
1954	5,897	2,020	7,917
1955	6,211	1,526	7,737
Total	113,190	21,974	135,164

TABLE 14.—*Registration of Physicians, 1904-1955*

Year	Examined	Passed	Failed, %	Reciprocity or Endorsement	Total Registered
1904	7,056	5,693	19.3	1,005	6,698
1905	7,178	5,688	20.8	394	6,082
1906	8,040	6,373	20.7	1,502	7,875
1907	7,279	5,731	21.3	1,427	7,158
1908	7,775	6,089	21.7	1,284	7,373
1909	7,295	5,865	19.6	1,381	7,246
1910	7,011	5,719	18.4	1,640	7,359
1911	6,964	5,582	19.8	1,243	6,825
1912	6,880	5,467	20.5	1,273	6,740
1913	6,453	5,253	18.6	1,292	6,545
1914	5,579	4,379	21.5	1,439	5,818
1915	5,334	4,507	15.5	1,399	5,906
1916	4,878	4,151	14.9	1,353	5,504
1917	4,754	4,085	14.0	1,360	5,445
1918	3,667	3,184	13.2	1,047	4,231
1919	4,750	4,074	14.2	2,546	6,620
1920	4,796	4,062	15.3	2,558	6,620
1921	4,825	4,228	12.4	2,186	6,414
1922	4,031	3,539	12.2	2,073	5,612
1923	4,727	4,028	14.8	2,405	6,433
1924	5,392	4,756	11.8	1,923	6,679
1925	6,092	5,450	9.2	1,861	7,311
1926	5,770	5,314	7.9	1,955	7,269
1927	5,389	5,002	7.2	2,176	7,178
1928	5,458	5,090	6.7	2,228	7,318
1929	5,629	5,282	6.2	2,420	7,702
1930	5,571	5,255	5.7	2,366	7,621
1931	5,611	5,263	6.2	2,211	7,476
1932	5,675	5,247	7.6	1,886	7,133
1933	5,673	5,244	7.6	1,989	7,233
1934	6,145	5,628	8.4	2,161	7,789
1935	6,443	5,859	9.1	2,194	8,053
1936	6,918	6,224	10.0	2,773	8,997
1937	7,334	6,604	10.0	3,205	9,809
1938	7,461	6,589	11.7	2,956	9,545
1939	7,754	6,493	16.3	2,872	9,365
1940	7,926	6,291	20.7	2,866	9,157
1941	7,539	6,057	19.7	2,762	8,819
1942	7,223	6,120	15.4	2,469	8,589
1943	8,403	7,489	10.9	2,340	9,829
1944	6,817	6,011	11.8	2,596	8,607
1945	5,930	5,343	9.9	3,622	8,965
1946	7,610	6,856	9.9	9,669	16,525
1947	7,164	6,414	10.5	7,701	14,115
1948	6,624	5,904	10.8	7,595	13,499
1949	5,963	5,219	12.5	6,929	12,148
1950	6,203	5,481	11.6	6,755	12,236
1951	6,473	5,716	11.7	6,225	11,941
1952	7,028	6,229	11.3	7,016	13,245
1953	7,425	6,543	13.0	7,869	14,412
1954	8,066	7,033	12.7	8,202	15,235
1955	8,501	7,400	12.9	7,461	15,962

TABLE 15.—*Graduates of Approved Schools and Others Registered, 1922-1955*

Year	Graduates of Approved Schools: No.	Graduates of Approved Schools: Percentage of Total	Others: No.	Others: Percentage of Total	Totals
1922	4,519	80.5	1,093	19.5	5,612
1923	5,196	80.8	1,237	19.2	6,433
1924	5,687	85.1	992	14.9	6,679
1925	6,314	86.4	997	13.6	7,311
1926	6,441	88.7	828	11.3	7,269
1927	6,410	89.4	768	10.6	7,178
1928	6,585	90.1	733	9.9	7,318
1929	7,003	91.0	699	9.0	7,702
1930	7,011	92.1	610	7.9	7,621
1931	6,932	92.8	544	7.2	7,476
1932	6,676	92.1	457	6.3	7,133
1933	6,774	93.7	459	6.3	7,233
1934	7,172	92.1	617	7.9	7,789
1935	7,360	91.3	693	8.5	8,053
1936	7,934	88.1	1,063	11.8	8,997
1937	8,391	85.5	1,418	14.4	9,809
1938	8,315	87.1	1,230	12.9	9,545
1939	8,067	86.2	1,298	13.8	9,365
1940	7,781	85.0	1,376	15.0	9,157
1941	7,770	87.9	1,049	11.9	8,819
1942	7,290	84.9	1,299	15.1	8,589
1943	8,640	87.9	1,189	12.2	9,829
1944	7,737	89.8	870	10.1	8,607
1945	8,233	91.8	732	8.1	8,965
1946	15,692	94.9	835	5.1	16,527
1947	13,097	93.0	1,018	7.0	14,115
1948	12,791	94.8	708	5.2	13,499
1949	11,378	93.7	770	6.3	12,148
1950	11,502	94.0	734	6.0	12,236
1951	11,027	92.3	914	7.7	11,941
1952	12,198	92.1	1,047	7.9	13,245
1953	13,189	91.5	1,223	8.5	14,412
1954	13,814	90.7	1,421	9.3	15,235
1955	13,344	89.8	1,517	10.2	14,861
Totals	298,270	87.2	32,438	9.5	330,708

In New York, a law approved April 10, 1946, provides that any osteopathic licentiate who had obtained the additional right to use instruments for minor surgical procedures and to use anesthetics, antiseptics, narcotics, and biological products, or any applicant who had met or would meet all the preliminary and professional requirements as of Sept. 1, 1936, and has satisfactorily passed surgery. Those in practice and licensed under a more limited law in effect prior to 1943 can secure a license to practice ostopathic medicine and surgery by meeting certain additional requirements, including postgraduate work and the passing of several additional examinations.

In Oregon osteopaths who meet certain requirements are granted the right to practice in the subjects covered

TABLE 16.—*Graduates of Unapproved Medical Schools Registered, 1951-1955*

	Examination						Reciprocity and Endorsement						Combined Totals
	1951	1952	1953	1954	1955	Totals	1951	1952	1953	1954	1955	Totals	
Arizona	..	..	..	..	..	..	2	..	..	1	..	3	3
California	..	..	..	..	..	..	..	..	8	19	15	42	42
Connecticut	..	..	..	..	..	..	..	1	..	..	..	1	1
Delaware	..	..	..	..	..	..	..	..	..	..	1	1	1
Florida	9	7	5	8	7	36	..	..	..	..	..	..	36
Georgia	1	..	1	2	..	4	1	1	1	..	..	3	7
Idaho	..	..	..	..	..	..	..	..	1	..	..	1	1
Illinois	2	..	..	..	..	2	..	..	..	2	4	6	8
Iowa	..	..	..	..	..	..	..	..	..	1	1	2	2
Maine	..	..	..	..	1	1	1	1	..	..	1	3	4
Maryland	..	5	..	..	..	5	..	..	..	..	..	..	5
Massachusetts	4	..	2	5	1	12	..	..	..	..	..	..	12
Michigan	..	..	..	..	..	..	1	1	..	1	..	3	3
Mississippi	1	..	..	..	..	1	..	..	..	..	..	..	1
Missouri	..	..	..	..	..	..	..	1	2	1	..	4	4
Nevada	..	..	..	..	..	..	..	2	..	..	..	2	2
New Jersey	..	..	[illegible]	1	..	[illegible]	..	..	..	..	..	..	4
New York	4	1	3	3	1	12	..	1	..	..	..	1	13
Ohio	..	..	..	..	3	3	..	..	1	3	..	4	7
South Dakota	..	..	..	..	1	1	..	..	..	..	..	..	1
Pennsylvania	1	2	..	..	..	3	..	1	1	..	1	3	6
Tennessee	..	..	..	..	..	..	..	..	1	..	..	1	1
Texas	..	..	..	..	..	..	45	18	9	7	3	82	82
Virginia	..	..	2	..	..	2	..	..	..	..	..	..	2
West Virginia	..	1	3	..	..	4	..	..	..	..	..	..	4
Wisconsin	..	..	..	..	..	..	1	2	..	..	1	4	4
Territories and Possessions	1	..	1	2	..	4	1	..	..	1	..	2	6
Totals	23	16	20	21	14	94	52	29	24	36	27	168	262

TABLE 17.—*Graduates of Schools of Osteopathy Registered by Medical Boards, 1951-1955*

	Examination						Reciprocity and Endorsement						Combined Totals
	1951	1952	1953	1954	1955	Totals	1951	1952	1953	1954	1955	Totals	
Colorado	10	5	8	3	7	33	..	3	15	22	16	56	89
Connecticut	1	1	2	3	..	7	..	..	..	..	..	..	7
Delaware	1	..	1	..	2	4	1	2	4	1	2	10	14
District of Columbia	..	..	..	..	..	..	1	..	..	1	1	3	3
Illinois	..	..	..	..	14	14	..	..	..	..	..	..	14
Indiana	..	7	5	2	6	20	9	9	10	11	9	48	68
Massachusetts	2	..	..	1	..	3	6	6	1	2	5	20	23
New Hampshire	..	..	..	..	..	..	..	1	3	1	3	8	8
New Jersey	2	11	11	7	8	39	6	15	10	18	7	56	95
New York	45	53	47	44	92	264	..	5	4	1	1	11	275
Ohio	46	47	61	81	73	311	8	7	20	13	2	50	361
Oregon	..	..	..	..	..	..	..	1	1	..	..	2	2
South Dakota	..	..	..	1	..	1	1	..	..	..	..	1	2
Texas	37	41	32	46	25	181	15	21	16	13	10	75	256
Virginia	..	..	..	..	..	..	..	1	1	1	..	3	3
Wisconsin	11	8	7	7	6	39	..	2	..	1	1	4	43
Wyoming	..	..	..	..	..	..	..	1	..	..	1	2	2
Totals	155	156	177	195	233	916	47	74	85	85	58	349	1,265

or would pass the regular licensing examination would be granted the right to practice medicine without limitation.

In 1943, the Ohio Medical Practice Act was amended to provide that all graduates from osteopathic schools applying for the right to practice in Ohio must meet certain educational requirements and must pass certain examinations. One of the required examinations is surgery. Those who qualify and pass all of the examinations are then given a license to practice osteopathic medicine and by the examination. In South Dakota, osteopaths may be issued a license to practice medicine, surgery, and obstetrics, which is an unrestricted license. Texas issues only one license, which is unrestricted in scope. In Virginia osteopaths may obtain the right to use drugs and to perform surgery with instruments.

The Wisconsin law, as amended in 1950, provides that an osteopath licensed in Wisconsin may obtain a license to practice medicine and surgery by completing

TABLE 18.—*Requirements of Premedical Training by Medical Licensing Boards*

Two Years or More of College

Alabama [1]	Maryland [5]	Pennsylvania [6]
Arizona [5]	Massachusetts [3]	Rhode Island
Arkansas	Michigan [5]	South Carolina [5]
California [2-3]	Minnesota	South Dakota [5]
Colorado [1]	Mississippi	Tennessee [5]
Connecticut [3]	Missouri	Texas
Delaware [4]	Montana	Utah [5]
District of Columbia	Nebraska	Vermont
Florida [5]	Nevada [5]	Virginia
Georgia	New Hampshire	Washington [1]
Idaho	New Jersey [4]	West Virginia
Illinois	New Mexico [5]	Wisconsin [3]
Indiana [3]	New York [6]	Wyoming [1]
Iowa [1]	North Carolina [5]	Alaska [5]
Kansas	North Dakota	Canal Zone
Kentucky	Ohio	Guam
Louisiana [5]	Oklahoma [5]	Hawaii
Maine	Oregon	Puerto Rico [4]
		Virgin Islands [5]

1. Not specified by law.
2. Three years for applicants matriculating in medical school after Jan. 12, 1954.
3. For all applicants courses in physics, chemistry, and biology must be included in premedical training.
4. Premedical training must include courses in English, physics, chemistry, biology, and a foreign language.
5. Three-year college requirement.
6. Premedical training must include courses in English, physics, chemistry, and biology.

TABLE 19.—*Professional Educational Requirements of Medical Licensing Boards*

	Length of Medical School Academic Year				Total Time Spent in Medical School, Registration to Graduation			
	Weeks	Months	Same as A.A.M.C. and C.M.E. & H.*	Not Specified by Board	Weeks Annual	Months Annual	Years	Same as A.A.M.C. and C.M.E. & H.*
Alabama	..	9	..	..	..	..	4	..
Arizona	..	..	x	..	..	..	..	x
Arkansas	..	9	..	..	..	..	4	..
California	..	9	..	..	..	..	4	..
Colorado	..	..	..	x	..	..	4	..
Connecticut	32	..	..	..	..	..	4	..
Delaware	..	..	..	x	..	..	4	..
District of Columbia	..	9	..	..	..	36	4	..
Florida	..	..	x	..	..	..	..	x
Georgia	..	9	..	..	..	..	4	..
Idaho	..	..	..	x	..	..	4	..
Illinois	..	9	..	..	..	..	4	..
Indiana	..	8	..	..	..	42	..	..
Iowa	..	..	..	x	..	..	4	..
Kansas	..	9	..	..	..	..	4	..
Kentucky	..	9	..	..	..	..	4	..
Louisiana	..	..	x	..	..	..	4	x
Maine	36	..	..	..	..	..	4	..
Maryland	..	..	x	..	..	..	4	x
Massachusetts	..	9	..	..	..	..	4	..
Michigan	32	..	..	..	..	36	..	..
Minnesota	36	..	..	..	..	..	4	..
Mississippi	32	..	..	..	..	..	4	..
Missouri	32	..	..	..	..	..	4	..
Montana	..	9	..	..	..	..	4	..
Nebraska	..	8	..	..	..	..	4	..
Nevada	..	9	..	..	..	..	4	..
New Hampshire	..	9	..	..	..	..	4	..
New Jersey	..	8	..	..	..	..	4	..
New Mexico	..	..	..	x	..	..	..	x
New York	..	8	..	..	..	..	4	..
North Carolina	..	..	..	x	..	..	4	..
North Dakota	..	8	..	..	..	32	4	..
Ohio	..	9	..	..	..	..	4	..
Oklahoma	..	10	..	..	..	..	4	..
Oregon	..	8	..	..	..	32	..	..
Pennsylvania	32	..	..	..	..	..	4	..
Rhode Island	..	..	..	x	..	..	4	..
South Carolina	..	9	..	..	..	..	4	..
South Dakota	..	..	..	x	..	..	..	x
Tennessee	36	..	..	..	..	..	..	x
Texas	..	8	..	..	..	..	4	..
Utah	..	9	..	..	..	..	4	..
Vermont †	..	..	..	..	..	..	4	..
Virginia	..	8	..	..	..	..	4	..
Washington	..	..	x	..	..	..	4	x
West Virginia	..	..	..	x	..	..	4	x
Wisconsin	..	..	x	..	..	..	4	x
Wyoming	..	..	x	..	..	..	..	x
Alaska	..	..	x	..	..	..	..	x
Canal Zone	..	9	..	..	..	..	4	..
Guam	..	9	..	..	..	..	4	..
Hawaii	..	..	..	x	..	..	..	x
Puerto Rico	..	..	x	..	..	..	4	x
Virgin Islands	..	..	..	x	..	..	4	..

* Association of American Medical Colleges and Council on Medical Education and Hospitals of the American Medical Association.
† 900 hours.
x implies yes.

a refresher course in materia medica and pharmacology consisting of not less than 64 hours of lecture and 60 hours of laboratory work and by passing an examination in these subjects. Osteopaths not licensed in the state may apply to take the same examination as physicians. If successful, they will be granted licenses to practice medicine and surgery. In Wyoming the statutes contain no specific provision for the licensing of osteopaths. The medical practice act provides that the certificate issued to all applicants shall be deemed a license to practice medicine in all branches in which the applicant has taken an examination.

TABLE 20.—*Licensure, Registration, or Other Requirements for Interns and Residents Serving in Hospitals*

Requirements for Interns

Licensure

Georgia	Wyoming	Puerto Rico

Other Requirements

Colorado [8]	Florida [6]	New Jersey [1]
Delaware [4]	Indiana [2]	South Carolina [2]
District of Columbia [5]	Massachusetts [7]	Virginia [4]
		West Virginia [8]

1. May serve for 2 years without licensure.
2. Must be eligible for licensure.
3. Registration with licensing board required annually not to exceed 4 years.
4. Registration with licensing board required.
5. Hospital must notify licensing board.
6. Must register every 6 months with state board of health and may serve for 3 years without licensure.
7. Limited registration for 1 year, renewable annually for a period not to exceed 5 years.
8. Graduates of foreign medical schools required to obtain permission from licensing board.

Requirements for Residents in Hospitals

Licensure or Temporary Registration Required

Arkansas	Maine [5]	Oklahoma [12]
California [1]	Massachusetts [6]	Pennsylvania [13]
Connecticut [2]	Michigan [7]	South Carolina
Georgia	Minnesota	South Dakota
Idaho	Mississippi	Texas
Illinois [3]	Nevada [8]	Virginia [5]
Indiana	New York [9]	Washington
Iowa [4]	North Carolina [10]	Wisconsin
Louisiana	Ohio [11]	Wyoming
		Puerto Rico

Other Requirements

Colorado [14]	District of Columbia [16]	New Jersey [18]
Delaware [15]	Florida [17]	West Virginia [19]

1. May serve 1 year without licensure.
2. May be required by hospitals.
3. Limited license for employment as residents in hospitals maintained by the state. Temporary certificate for residency or specialty training for noncitizens in approved Illinois hospitals.
4. Resident's license issued for 1 year and may be renewed for an additional 3 years.
5. Temporary license granted.
6. Limited registration granted.
7. Temporary licensure for graduate training.
8. Temporary permit for one year.
9. Temporary certificate for residents in approved hospitals to those eligible for licensure.
10. Limited license issued.
11. If a resident assumes full responsibility and receives pay for services.
12. Temporary licensure for 1 year, renewable for 2 additional years.
13. Temporary certificate for residency training in approved hospitals in the state, renewable annually.
14. Registration with licensing board required annually not to exceed 4 years.
15. Registration with licensing board required.
16. Hospital must notify licensing board.
17. Must register with state board of health every six months and may serve residency for three years without licensure.
18. May serve 2 years without licensure.
19. Graduates of foreign medical schools required to be licensed.

Preprofessional Requirements of Licensing Boards

Since January, 1953, the minimum requirement for admission to an approved medical school has been three years of college preparatory study. The Council on Medical Education and Hospitals in accepting this minimum recommends for most students a full four-year college course in order that a broader background education may be obtained. In its "Essentials of an Acceptable Medical

School" the Council also makes provision for the unusually intelligent and mature student, stating that "rarely a school will be justified in admitting a superior student under exceptional conditions after two years of college work."

TABLE 21.—*Temporary and Educational Permits, Limited and Temporary Licenses, or Other Certificates Issued by State Licensing Boards*

Arizona	Temporary permits issued in emergency (inability of the local physicians and surgeons in any community to meet conditions affecting the public health that may arise suddenly and unexpectedly by reason of fire, flood, explosion, epidemic, pestilence, or like disaster, or through some unusual occurrence or condition which in the judgment of a majority of the Board, constitutes an emergency)
Connecticut	Educational permits for graduates of foreign medical schools not licensed to practice
Delaware	Locum tenens; emergency
Georgia	Temporary permits until board meets
Idaho	To candidates holding certificates of the National Board of Medical Examiners or licensed by written examination in another state until next meeting of board
Illinois	Temporary certificates for specialty study or residency in Illinois hospitals for noncitizens who do not expect to remain in Illinois. Limited licenses for employment as residents in hospitals maintained by the state
Indiana	Temporary license only pending next examination, if not eligible for endorsement
Iowa	Resident license valid for one year and renewable for three additional years
Kansas	Temporary permits and fellowships. Temporary permits to allow practice during intervening period until action of the board on application through endorsement. Fellowships restricted to state institutions and state hospitals. Doctor holding fellowship works under direction of the head of the institution
Kentucky	Temporary and limited. Temporary permits serve applicants by endorsement until investigation completed and meeting of board. Limited licenses are for special place and purpose.
Louisiana	Temporary permit is granted to physicians possessing the necessary credentials who file applications for examination or reciprocity and who locate in Louisiana in between the regular semiannual examination meetings of the board. Temporary permit valid until the next meeting of the board
Maine	Temporary licenses granted for residency training for one year and to camp physicians for 10 weeks
Michigan	Temporary license for training program
Mississippi	Temporary permit for practice until next board meeting
Nevada	Temporary permit granted for one year for residency training within a specific Nevada hospital
New Hampshire	Temporary permit for locum tenens, emergencies, etc. Time varies
New Jersey	Temporary licenses issued for not less than 2 weeks or more than 4 months
New Mexico	Temporary permit for practice until next board meeting. Special permit confined to institutional practice
New York	Temporary certificate for residency training for those eligible for examination
North Carolina	Limited licenses issued for duration of residency
Oklahoma	Temporary licenses issued for residency training only
Pennsylvania	Temporary certificates are issued for residency training
South Dakota	Temporary license issued only for graduates of foreign schools
Texas	Temporary permit issued until next board meeting
Virginia	Temporary permit issued until next board meeting and for service as a hospital resident
West Virginia	Temporary permit issued until next board meeting to qualified applicants
Wisconsin	Temporary permit for foreign students whose schools are not recognized by this board for licensure
Alaska	Temporary permits issued while processing permanent licensure, to summer cannery physicians and to physicians in the armed forces on short tours of duty, valid for 6 months, renewable an additional 6 months
Guam	Restrictive certificates to permit medical employees of federal contractors to practice in the discharge of their official duties
Puerto Rico	Provisional license pending permanent licensure granted foreign-trained physicians to work on charity services
Virgin Islands	Temporary certificates issued to military service personnel on duty and to municipal personnel until next license examination

The preprofessional requirements of medical licensing boards are indicated in table 18. In five states no preprofessional requirement is mentioned in the medical practice act. Twenty boards reported a three-year requirement. In others, the law specifies at least two years of college work. No board specifies in detail the number of hours that must be devoted to the subjects of the medical curriculum, although 10 boards report that this training must include certain subjects, such as English, physics, chemistry, biology, and a foreign language. While the current premedical requirment for admission to medical school is three years of college work, the statistics [3] show that 75% of the entering class in 1954-1955 had had four years of college work, many of the candidates appearing for medical licensure are graduates before the year 1953 and have the premedical requirement that was in effect at the time of their matriculation into medical school. In general, the boards in granting licensure to a graduate of an approved medical school accept the premedical requirement in effect in the year the candidate was admitted to medical school.

3. J. A. M. A. **159**: 586 (Oct. 8) 1955.

TABLE 22.—*Medical Schools Requiring an Internship*

United States
Duke University School of Medicine *
Canada
University of Manitoba Faculty of Medicine
Dalhousie University Faculty of Medicine
University of Ottawa Faculty of Medicine
Laval University Faculty of Medicine
University of Montreal Faculty of Medicine

* Degree not withheld until internship completed.

Approval of Medical Schools

Six licensing boards maintain their own list of approved medical schools in the United States. Twenty-six boards require applicants for licensure from medical schools in the United States or Canada to be graduates of medical schools approved by the Council on Medical Education and Hospitals. One board requires membership in the Association of American Medical Colleges. Twenty-one boards specify that schools must be approved by the Council and members of the Association of American Medical Colleges. In the majority of instances the requirement is specified in the medical practice act or a formal regulation of the board. In only two instances did a board specify the requirement is an informal policy. In actuality, all approved medical schools are both approved by the Council and members of the Association of American Medical Colleges.

TABLE 23.—*Medical Licensing Boards Requiring a One-Year Internship* *

Alabama	Michigan †	Vermont †
Arizona	Nevada	Washington †
California	New Hampshire	West Virginia
Colorado	New Jersey ‡	Wisconsin
Delaware †	North Dakota	Wyoming †
District of Columbia	Oklahoma †	Alaska §
Idaho	Oregon	Canal Zone
Illinois †	Pennsylvania †	Hawaii †
Iowa	Rhode Island †	Puerto Rico †
Kentucky	South Dakota	Virgin Islands †
Maine	Utah	

* Some states require the internship for graduates of medical faculties abroad and from reciprocity or endorsement applicants.

† Internship must be a rotating service.

‡ One-year general rotating internship or 2-year residency in a specialty.

§ Unless in active practice for 4 years.

Professional Educational Requirements of Licensing Boards

The length of the medical course is specified in the medical practice acts or board regulations of several of the medical licensing boards. In other states the law or ruling reads that the professional educational requirement accepted for approval by the Council on Medical Educa-

tion and Hospitals or for membership in the Association of American Medical Colleges, or both, is the regulation for licensure. Table 19 outlines the requirement of each state in this respect. This table does not record the internship, which is a requirement for licensure by 31 boards.

Licensure, Registration, or other Requirements for Interns and Residents Serving in Hospitals

In the majority of states, physicians serving internships are not required to be licensed in the state in which the hospital where they are interning is located. Georgia, Wyoming, and Puerto Rico have this requirement. New Jersey permits a service of two years without licensure and Florida a three-year service before licensure. Indiana and South Carolina report that the intern must be eligible for licensure in the state. Colorado, Delaware, and Virginia, require an intern to register with the board. In the District of Columbia the hospital must notify the licensing board when they employ an intern. Massachusetts permits limited registration for one year, renewable annually for a period not to exceed five years. In West Virginia graduates of foreign medical schools are required to obtain permission from the licensing board before commencing an internship in the state.

TABLE 24.—*Schedule of Written Examination Dates and Issuance of Licenses by Reciprocity or Endorsement of Credentials*

	Written Examinations Held	Licenses by Reciprocity or Endorsement Issued
Alabama	Annually	Continuously
Arizona	Quarterly	Quarterly
Arkansas	June and November	Continuously
California	Quarterly	Continuously
Colorado	Twice annually	Quarterly
Connecticut	March, July, and November	Continuously
Delaware	January and July	January and July
District of Columbia	Twice annually	Quarterly
Florida	Twice annually	No reciprocity
Georgia	June and October	June and October
Idaho	Twice annually	Twice annually
Illinois	Quarterly	Quarterly
Indiana	Annually, June	Every six weeks
Iowa	Twice annually	Once monthly
Kansas	June and December	June and December
Kentucky	Semiannually	Six times annually
Louisiana	June and December	June and December
Maine	Three annually	Three annually
Maryland	Twice annually	Monthly
Massachusetts	January and July	Monthly except August
Michigan	June and October	Continuously
Minnesota	Quarterly	Quarterly
Mississippi	Annually	Twice annually
Missouri	Three annually	Six times annually
Montana	Semiannually	Semiannually
Nebraska	Annually	Continuously
Nevada	Quarterly	Quarterly
New Hampshire	Twice annually	Twice annually
New Jersey	Four annually	Monthly except August
New Mexico	May and November	May and November
New York	February, June, and October	Continuously
North Carolina	Annually	Five times annually
North Dakota	January and July	January and July
Ohio	June and December	Quarterly
Oklahoma	Annually	Quarterly
Oregon	January and July	Quarterly
Pennsylvania	January and July	Monthly
Rhode Island	Quarterly	Quarterly
South Carolina	Twice annually	Quarterly
South Dakota	Twice annually	Continuously
Tennessee	Quarterly	Continuously
Texas	Twice annually	Quarterly
Utah	Once annually	Quarterly
Vermont	Twice annually	Continuously
Virginia	Twice annually	Twice annually
Washington	Twice annually	Twice annually
West Virginia	Twice annually	Quarterly
Wisconsin	Twice annually	Quarterly
Wyoming	Three annually	Three annually
Alaska	On application	On application
Canal Zone	On application	On application
Guam	On application	On application
Hawaii	January and July	Continuously
Puerto Rico	Twice annually	Continuously
Virgin Islands	Twice annually	Twice annually

Twenty-seven boards require that physicians serving as residents in hospitals must be licensed in the state. In California the resident may serve one year without licensure. In Connecticut it is not a requirement of the licensing board but is customarily required by hospitals in that state, while Ohio reports that licensure is required if the resident assumes full responsibility and receives pay

TABLE 25.—*Medical Licensure Fees*

	Examination	Reciprocity or Endorsement
Alabama	$ 10	$ 50
Arizona	25	100
Arkansas	50	100
California	25	100
Colorado	25	50
Connecticut	35	75
Delaware	25	100
District of Columbia	25	50*
Florida	50	...
Georgia	20	50
Idaho	25	100
Illinois	15	25
Indiana	25	100
Iowa	25	50
Kansas	35	50
Kentucky	50	75
Louisiana	25	50
Maine	27	52
Maryland	35	50
Massachusetts	25	50
Michigan	50	100
Minnesota	25	100
Mississippi	10	50
Missouri	25	100
Montana	50	75
Nebraska	25	50
Nevada	100	200
New Hampshire	30	50
New Jersey	50	100
New Mexico	50	50
New York	40	40
North Carolina	50	100
North Dakota	25	50
Ohio	25	50
Oklahoma	25	100
Oregon	25	100
Pennsylvania	25	50
Rhode Island	20	20
South Carolina	25	50
South Dakota	20	50
Tennessee	35	50†
Texas	50	100
Utah	25	50
Vermont	20	50
Virginia	25	100
Washington	25	25
West Virginia	25	100
Wisconsin	50	100
Wyoming	25	50
Alaska	25	100
Canal Zone	10	5
Guam	50	50
Hawaii	25	25
Puerto Rico	30	30
Virgin Islands	65	...

* Endorsement of certificate of National Board of Medical Examiners, $25.

† Endorsement of certificate of National Board of Medical Examiners, $10.

TABLE 26.—*States Requiring Annual Registration*

State	Fee	State	Fee	State	Fee
Arizona	$ 5	Minnesota	$ 3	Tennessee	$ 5
Arkansas	a	Missouri*	5	Texas	5
California	2	Montana	d	Utah	3
Colorado	b	Nebraska	2	Vermont	2
Connecticut	2	Nevada	5	Virginia	1
Dist. of Columbia	4	New Mexico	e	Washington	7
Florida	1†	New York*	6	West Virginia*	2
Georgia	3	North Dakota	f	Wisconsin	3
Idaho	10	Oklahoma	3	Wyoming	2
Indiana	c	Oregon	g	Alaska	10
Iowa	3	Pennsylvania	1	Guam	None
Kansas	3	Rhode Island	1	Hawaii	2
Louisiana	10	South Dakota	2	Virgin Islands	50

* Biennial registration.
† Required by State Board of Health.
a. Residents $2, nonresidents $4.
b. Residents $2, nonresidents $10.
c. Residents $5, nonresidents $10.
d. Residents $5, nonresidents $1.
e. Residents $2, nonresidents $5.
f. Residents $5, nonresidents $2.
g. Residents $15, nonresidents $5.

for services. Ten boards do not require full licensure of residents but issue certificates limited in nature, which may be called a limited license, a resident's license, temporary permit, or temporary license. In Massachusetts limited registration is granted. Colorado, Delaware, and Florida require the resident to register with the board for periods of three to four years without licensure. The District of Columbia specifies that the hospital must notify the licensing board when it employs a resident. New Jersey indicates that residents may serve two years without licensure, while in West Virginia graduates of foreign medical schools serving as residents must be licensed in the state.

The regulations of each of the licensing boards that exact some requirement of those engaged in intern or residency training are given in table 20.

Foreign Medical Schools

List Prepared by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges

On the basis of information presently available, the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges are of the opinion that medical institutions and medical organizations in the United States would be justified in considering current and past graduates of the following foreign medical schools on the same basis that they consider graduates of approved medical schools in the United States. This recommendation is intended only for those students who successfully completea course of study identical in all respects with that necessary to be eligible for licensure in the country in which the school is located. *Because this list is acknowledged to be a tentative one, the position of the councils with respect to schools not named in the list is that they neither approve nor disapprove them.*

Belgium

Free University of Brussels Faculty of Medicine
(Université Libre de Bruxelles Faculté de Médecine)
Catholic University of Louvain Faculty of Medicine
(Université Catholique de Louvain Faculté de Médecine, or
Katholieke Universiteit te Leuven)
University of Ghent Faculty of Medicine
(Universiteit to Gent Faculteit der Geneeskunde, or
Université de Gand Faculté de Médecine)
University of Liège Faculty of Medicine
(Université de Liège Faculté de Médecine)

Brazil

University of São Paulo Faculty of Medicine
(Universidade de São Paulo Faculdade de Medicina)

China

Peiping Union Medical College

This recommendation applies to all those graduates who were granted the degree of Doctor of Medicine from the date when the first degrees were conferred in 1924 until and including the class of 1943. The education of students in the last class, that of 1943, was interrupted by World War II; therefore, some students finally completed their studies as late as 1949. However, their diplomas were issued as of the class of 1943. Following the communist conquest of China, the name of this school was changed to the China Union Medical College. The recommendation does not apply to this school.

Denmark

University of Copenhagen Faculty of Medicine
(Kobenhavns Universitet Laegevidenskabelige Fakultet)

Finland

University of Helsinki Faculty of Medicine
(Helsingfors Universitet Medicinska Fakulteten)
Medical Faculty Turku University
(Turun Yliopiston Laaketieteellinen Tiedekunta)

Lebanon

American University of Beirut School of Medicine

Netherlands

University of Amsterdam Faculty of Medicine
(Universiteit van Amsterdam Geneeskunde Faculteit)
State University of Groningen Faculty of Medicine
(Rijks-Universiteit te Groningen Geneeskunde Faculteit)
State University of Leiden Faculty of Medicine
(Rijks-Universiteit te Leiden Faculteit der Geneeskunde)
State University of Utrecht Faculty of Medicine
(Rijks-Universiteit te Utrecht Faculteit der Geneeskunde)

The Doctoral Examen that is given at the end of the theoretical part of the study of medicine does not confer the degree of Doctor nor the right to practice medicine. The Arts Examen that is given following the completion of an additional two years of practical work in hospitals confers the title of Doctor and also the right to practice medicine.

Norway

University of Oslo Faculty of Medicine
(Kongelige Frederiks Universitet Medisinske Fakultet)

Sweden

Royal Charles University Medical Faculty, Lund
(Kungl. Karolinska Universitetet Medicinska Fakulteten)
Charles Medico-Surgical Institute, Stockholm
(Karolinska Mediko-Kirurgiska Institutet)
Royal University of Uppsala Medical Faculty
(Kungl. Universitetet i Uppsala Medicinska Fakulteten)

Switzerland

University of Basel Faculty of Medicine
(Universität Basel Medizinische Fakultät)
University of Bern Faculty of Medicine
(Universität Bern Medizinische Fakultät)
University of Geneva Faculty of Medicine
(Université de Genève Faculté de Médecine)
University of Lausanne Faculty of Medicine
(Université de Lausanne Faculté de Médecine)
University of Zurich Faculty of Medicine
(Universität Zurich Medizinische Fakultät)

The recommendation with respect to the following medical schools in Switzerland applies only to those graduates of Swiss medical schools who hold the Swiss-Federal Diploma issued by the Federal Department of the Interior (Eidgendoissisches Department Des Innern, Département Féderal de L'Intérieur) and obtainable only by Swiss citizens who hold the Certificate of Medical Studies (Akademische Zeugnis, Certificat d'Études Médicales) or who hold one of the following certificates which the Swiss Universities issue to those, not citizens of Switzerland, who complete a course of study and pass examinations equivalent to those taken by Swiss citizens in qualifying for the Swiss Federal Diploma:

University of Basel—Academic Certificate on passing the medical examination for physicians (Akademische Zeugnis über die bestandene Fachprufung für Ärzte).

University of Bern—Medical diploma on passing examination for medicine (Aerztliches Fakultats diplom über die bestandene Fachprufung für Ärzte).

University of Geneva and University of Lausanne—Certificate of Medical Studies (Certificat d'Études Médicales).

University of Zurich—Medical diploma for Foreigners (Medizinisches Diplom für Ausländer).

United Kingdom

England

University of Birmingham Faculty of Medicine
University of Bristol Faculty of Medicine
University of Cambridge Faculty of Medicine
University of Durham Medical School, Newcastle-upon-Tyne
University of Leeds Faculty of Medicine
University of Liverpool Faculty of Medicine
University of London*
University of Manchester Faculty of Medicine
University of Oxford Faculty of Medicine
University of Sheffield Faculty of Medicine

Northern Ireland

Queen's University of Belfast Faculty of Medicine

Scotland

University of Aberdeen Faculty of Medicine
University of Edinburgh Faculty of Medicine
University of Glasgow Faculty of Medicine
University of St. Andrews Medical School, St. Andrews and Dundee

Wales

Welch National School of Medicine, University of Wales, Cardiff

The recommendation applies only to those physicians trained in the United Kingdom who hold medical degrees from the universities listed. The recommendation does not apply to those physicians who received their medical training at these universities or their affiliated hospital medical schools but who obtained their qualifications through the examinations of the licensing corporations of the United Kingdom. It must be observed, however, that registration in the United Kingdom is granted equally to physicians holding the diplomas of the licensing corporations and to physicians holding university medical degrees.

* Work for the medical degree of the University of London is offered at the following hospital medical schools:

Charing Cross Hospital Medical School
Guy's Hospital Medical School
King's College Hospital Medical School
London Hospital Medical School
Middlesex Hospital Medical School
Royal Free Hospital School of Medicine
St. Bartholomew's Hospital Medical College
St. George's Hospital Medical School
St. Mary's Hospital Medical School
St. Thomas' Hospital Medical School
University College Hospital Medical School
Westminster Hospital Medical School

TABLE 27.—STATUS OF REQUIREMENTS FOR MEDICAL LICENSURE FOR PHYSICIANS TRAINED IN FOREIGN COUNTRIES OTHER THAN CANADA*

	Written Examination Required	Admitted Also on Reciprocal Basis	Citizenship	Basic Science Certificate	Internship in United States	Recognition Limited to Graduates of Schools Accepted by A.M.A. and A.A.M.C.	Additional Requirements	Exemptions	Examination Fee, Dollars
Alabama	x	..	x	..	x	..	x	..	10
Arizona	x	..	1st P	x	x	x	..	x	25
Arkansas	Not accepted								
California	x	..	..	..	x	..	x	x	25
Colorado	x	..	x	x	x	x	x	..	25
Connecticut	x	x	1st P	x	..	..	..	..	35
Delaware	x	..	x	..	x	..	x	..	25
Dist. of Columbia	x	x	..	x	x	x	..	x	25
Florida	x	..	x	x	..	x	..	..	50
Georgia	x	x	x	..	..	x	..	..	20
Idaho	Not accepted								
Illinois	x	..	1st P	..	x	..	x	..	15
Indiana	x	..	..	..	..	..	x	..	25
Iowa	x	..	1st P	x	x	x	x	..	25
Kansas	x	x	x	..	x	..	..	x	35
Kentucky	x	..	x	..	x	..	x	..	50
Louisiana	Not accepted								
Maine	x	..	x	..	x	..	..	..	27
Maryland	x	..	1st P	..	x	..	..	x	25
Massachusetts	x	..	1st P	..	..	..	..	x	25
Michigan	x	..	x	x	x	..	x	..	50
Minnesota	x	..	x	x	x	x	x	..	25
Mississippi	x	..	x	..	..	x	..	..	10
Missouri	x	..	x	..	x	..	..	..	25
Montana	Not accepted								
Nebraska	x	..	x	x	..	x	..	..	25
Nevada	Not accepted								
New Hampshire	x	x	x	..	x	..	..	x	30
New Jersey	x	x	x	..	x	..	x	x	50
New Mexico	x	..	1st P	x	..	x	..	..	50
New York	x	..	1st P	..	..	..	x	..	30
North Carolina	x	..	x	..	..	x	..	x	50
North Dakota	x	..	x	..	x	..	..	x	25
Ohio	x	..	x	..	..	..	..	x	25
Oklahoma	x	..	..	x	x	x	..	..	25
Oregon	Not accepted								
Pennsylvania	x	..	1st P	..	x	x	..	x	25
Rhode Island	x	..	1st P	x	x	..	x	x	20
South Carolina	Not accepted								
South Dakota	x	..	1st P	x	x	..	x	..	20
Tennessee	x	..	x	x	..	x	..	..	35
Texas	Not accepted								
Utah	Not accepted								
Vermont	x	..	x	..	x	..	x	..	20
Virginia	x	..	1st P	..	x	..	x	x	25
Washington	x	..	..	x	..	x	..	..	25
West Virginia	x	..	x	..	x	..	x	..	25
Wisconsin	x	x	1st P	x	x	x	x	..	25
Wyoming	Not accepted								
Alaska	x	x	x	x	..	x	..	..	25
Canal Zone	Not accepted								
Guam	x	x	..	..	x	x	..	..	50
Hawaii	x	..	x	..	x	x	..	x	25
Puerto Rico	Not accepted								
Virgin Islands	x	..	..	..	x	x	x	..	65

This summary should be supplemented by direct communication with the secretary of the licensing board of the state in which the physician is interested.

x Implies yes.

* Graduates of medical schools of Canada considered for licensure on the same basis as graduates of approved medical schools in United States provided they comply with regulations pertaining to citizenship and internship.

Additional Requirements

Alabama. Candidate is eligible if he is certified by the National Board of Medical Examiners and approved.

California. Applicant must present documentary evidence, satisfactory to the board (a) of completion in a medical school or schools of a resident course of professional instruction equivalent to that given in an American school, (b) that he is in possession of a medical diploma, (c) that he has been admitted or licensed to practice medicine in the country wherein is located the institution in which he completed his training, and (d) that, if he is not a citizen of the United States, the country in which he has been licensed will admit to practice citizens of the United States. Applicants must pass a written, clinical, and oral examination. A two-year internship is required of noncitizens.

Colorado. Credentials must be submitted in original form and accompanied by translation and will be directly verified or documents should bear evidence of being visaed by the U. S. Consul in the country wherein the school of graduation is or was located.

Delaware. Residence for one year required. Completion of senior year in approved medical school in the United States.

Illinois. Approved rotating internship in United States required. Limited license issued for practice in hospitals maintained by the state.

Indiana. Shall be graduate of foreign medical school approved by Indiana Board; in addition thereto, repeat the senior year in an approved medical school in the United States, or two years postgraduate work in approved hospitals in the United States.

Iowa. Internship or one year in medical school in the United States.

Kentucky. Applicant required to complete at least five years' training in the United States in an institution approved by the board and to have successfully passed examination of National Board of Medical Examiners.

Michigan. Completion of senior year in approved medical school in the United States or Canada, or M.S. degree in any field allied with medicine from a graduate school affiliated with an approved medical school, or, in lieu of above, certificate of an oral comprehensive examination in the basic sciences and clinical medicine by a joint screening board of examiners, from the faculties of the medical schools of the University of Michigan and Wayne University.

Minnesota. Two year internship in Minnesota required. Credentials must be submitted in original form and accompanied by notarized photostatic copies translated and will be verified, and documents should bear evidence of being visaed by the United States Consul in the country wherein the school is located.

New Jersey. Original certificate covering medical courses, original diploma and license in foreign country with translation by the Lawyers' and Merchants' Translation Bureau, 11 Broadway, New York City.

Rhode Island. Must pursue postgraduate study or serve additional one year internship or residency. After Jan. 14, 1955 must serve approved rotating internship in Rhode Island. Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located.

South Dakota. Applicant required to practice in an emergency area for four years under a temporary license and reappear before the board for permanent licensure. After July 1, 1955, only those cleared through IRO will be eligible.

Vermont. Must be diplomate of National Board of Medical Examiners.

Virginia. Applicant must be licensed to practice medicine and surgery in country in which school of graduation is located, or must have completed the course of study and passed examinations equivalent to those required for a diploma or license conferring such full right to practice.

West Virginia. Applicant must be resident of the state for three years preceding application and be recommended by local medical society.

Wisconsin. 1953 Legislature established One Year Temporary Educational Permit, which authorizes graduates of unapproved foreign schools to obtain residency training in approved hospitals. May be renewed for two additional years.

Virgin Islands. Residence of six months required.

Exemptions

District of Columbia. Considered for reciprocal or endorsement registration on an individual basis.

Illinois. Graduates of European medical colleges or universities after Jan. 1, 1943, with the exception of certain approved colleges in the British Isles, Denmark, Holland, Norway, Sweden, and Switzerland, will not be accepted after July 1, 1954. However, graduates of such European medical colleges after Jan. 1, 1943, may be considered providing they present diplomas of graduation from approved medical colleges in the United States after attendance in such colleges for at least one year, and, in addition, have served rotating internship of one year in an approved hospital in Illinois.

Kansas. Applicant must be licensed to practice in country of graduation. Application must be filed one year in advance.

Maryland. Graduates of recommended medical schools may be accepted after completion of one year of internship or residency in an approved hospital in the United States if their credentials have been approved and they have presented at least two letters from the medical authorities in the hospital recommending them as to their professional ability and moral character.

Graduates, not on the recommended list, who obtained the medical degree after Jan. 1, 1940, are not eligible; must serve three years in hospitals in the United States and submit recommendations from the hospitals.

Graduates of foreign medical schools, before Jan. 1, 1940, whose schools were known to have had acceptable standards at the time of graduation may be considered if credentials and professional experience in the United States are acceptable to the board.

Ability to write and speak English clearly is a primary requisite.

Massachusetts. Graduates of foreign medical schools who matriculated in medical school prior to Jan. 1, 1941, are eligible to apply for admission to the examinations. Graduates after Jan. 1, 1941, must be graduates of a medical school approved by the Approving Authority for Colleges and Medical Schools of the Commonwealth of Massachusetts. The board has approved the School of Physic, Trinity College, Dublin, Ireland, and the University of London.

New Hampshire. Diplomates of National Board of Medical Examiners eligible on reciprocity basis. Temporary license valid until citizenship is completed may be given. Considered on an individual basis.

New Jersey. Internship completed in foreign countries after July 1, 1934, not acceptable. Acceptance limited to schools recognized by the board. Considered on an individual basis. After Jan. 1, 1955 must have minimum of three years' training in a hospital approved by the board.

New York. Considered on an individual basis.

North Carolina. Considered on an individual basis.

North Dakota. Not accepted unless certified by an American specialty board. Considered on an individual basis.

Ohio. Graduates of schools of Continental Europe after 1943 are eligible if on accepted list. If not licensed in a foreign country must have one year in hospital in the United States; if not on accepted list, two years of training in an approved hospital in the United States. Considered on individual basis.

Pennsylvania. Medical schools in China and Japan not acceptable.

Rhode Island. Matriculants in foreign medical faculties subsequent to Jan. 1, 1949, not acceptable unless applicant was a legal resident of Rhode Island at the time of matriculation at a foreign medical school and obtained his preprofessional training in the United States or Canada.

Texas. European graduates after 1939 limited to English speaking schools.

Virginia. Graduates of medical schools on accepted list admitted on same basis as approved medical schools in United States. Graduates of other schools having the required length of study and diploma required for practice in the country of their graduation, two years of internship in approved hospital in United States or Canada within past five years prior to application, or one year of study in an approved medical school in lieu of one year of the internship may be considered for examination. If United States citizenship has not been acquired in seven years, license becomes invalid.

Hawaii. Diplomates of National Board eligible on reciprocity basis.

TABLE 28.—FOREIGN-TRAINED PHYSICIANS EXAMINED

Marginal Number	SCHOOL	1 Alabama P	F	2 Arizona P	F	3 California P	F	4 Colorado P	F	5 Connecticut P	F	6 Delaware P	F	7 Dist. of Columbia P	F	8 Florida P	F	9 Georgia P	F	10 Illinois P	F	11 Indiana P	F	12 Iowa P	F	13 Kansas P	F	14 Louisiana P	F
	ARGENTINA																												
1	Universidad Nacional de Buenos Aires	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
2	Universidad Nacional del Litoral, Rosario	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	Universidad Nacional de Cordoba	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	AUSTRALIA																												
4	University of Adelaide Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	University of Sydney Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	University of Melbourne Faculty of Medicine	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	AUSTRIA																												
7	Karl-Franzens Universitat, Graz	..	..	..	..	3	0	..	..	0	2	..	..	..	..	..	..	..	..	3	2	..	..	..	..	..	..	..	..
8	Leopold Franzens Universitat, Innsbruck	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	0	..	..	4	3	..	..	0	1	..	..	..	..
9	Universitat Wien	..	..	..	..	8	1	..	..	0	2	..	..	..	..	..	..	..	..	4	5	..	..	0	1	1	0	..	..
	BELGIUM																												
10	Universite Gent	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
11	Universite Catholique de Louvain Faculte de Medecine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
12	Universite Libre de Bruxelles Faculte de Medecine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	BRAZIL																												
13	Faculdade de Medicine e Cirurgia do Para	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
14	Universidade de Rio de Janeiro	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	BULGARIA																												
15	University of Sofia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
	CHILE																												
16	Universidad de Chile, Santiago	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CHINA																												
17	University of Hongkong Faculty of Medicine	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
18	Peiping Union Medical College	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
19	Hsiang Ya Medical College, Changsha	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..
20	Pennsylvania Medical School, Shanghai	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	Cheeloo University School of Medicine, Shantung	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	Hackett Medical College for Women, Canton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	Women's Christian Medical College, Shanghai	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	Southeastern Medical College, Shanghai	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	1	..	..	..	..	..	..	..	..	..	..	..	..
25	National College of Medicine of Shanghai	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
26	West China Union University School of Medicine, Chengtu, Szechwan	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27	College of Medicine, National Sun Yat-Sen University, Canton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
28	Aurora University French School of Medicine, Shanghai	..	..	..	..	4	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..
29	National Central University College of Medicine, Nanking	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
30	Tung Nan Shi University, College of Medicine, Ahenhai, Kiangsu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
31	National Kiangsu Medical College, Chengkiang, Kiangsu	..	..	..	..	0	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
32	National Kweiyang Medical College, Kweiyang, Kweichow, China	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
33	Lanchow University Medical College, Lanchow, Kansu	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
34	National Chung Cheng Medical College, Nan Chang, China	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
35	Fukien Provincial Medical Foochow, Fukien	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CHOSEN																												
36	Severance Union Medical College, Keijo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..
	COLOMBIA																												
37	Universidad Nacional Facultad de Medicine, Bogota	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
38	Universidad de Antioquia Facultad de Medicine, Medellin	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	CUBA																												
39	Universidad de la Habana	..	..	..	..	3	3	..	..	0	2	..	..	..	..	6	2	..	..	13	13	..	..	..	..	..	..	..	..
	CZECHOSLOVAKIA																												
40	Deutsche Universitat, Prag	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
41	Universita Karlova, Praha	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	0	..	..	1	6	..	..	..	..	..	..	..	..
42	Univerzita Komenskeho, Bratislava	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..
43	Masarykova Universita, Brno	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	DENMARK																												
44	Kobenhavns Universitet	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	DOMINICAN REPUBLIC																												
45	Universidad de Santo Domingo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ECUADOR																												
46	Universidad Central Facultad de Ciencias Medicas, Quito	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	0	1	..	..	..	..	..	..
	EGYPT																												
47	Egyptian University Faculty of Medicine, Cairo	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
48	Fouad First University Faculty of Medicine, Cairo	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	EL SALVADOR																												
49	Universidad de El Salvador, San Salvador	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
	ENGLAND																												
50	University of Birmingham	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
51	University of Bristol	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
52	University of Cambridge	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
53	University of Durham Medical School, Kings College	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
54	University of Liverpool	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
55	University of London	..	..	..	..	1	0	..	..	2	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0
56	University of Oxford	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
57	University of Sheffield	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
58	Licentiate Royal College of Physicians of London and Member Royal College of Surgeons of England	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
	ESTONIA																												
59	Tartu Ulikooli	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	0	2	..	..	..	..	..	..	..	..
	FRANCE																												
60	Universite de Lyon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
61	Universite de Montpelier	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
62	Universite de Nancy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
63	Universite de Paris	..	..	..	..	1	1	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
64	Universite de Toulouse	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
65	Universite de Strasbourg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Marginal Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Nebraska	New Hampshire	New Jersey	New Mexico	New York	North Dakota	Ohio	Pennsylvania	Rhode Island	South Dakota	Texas	Virginia	Washington	Wisconsin	Hawaii, Alaska, Puerto Rico, Virgin Islands	Totals	Examined—Passed	Examined—Failed	% Failed	Number of Boards Examined by	Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
.. .. 1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	5	3	2	40.0	4	1
.. .. 1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	2
.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	3
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	4
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	5
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	3	3	0	0.0	3	6
.. .. 0 1	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 3	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	18	10	8	44.4	7	7
.. .. 1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	1 1	.. ..	2 3	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	21	11	10	47.6	9	8
.. ..	.. ..	0 1	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	6 11	1 0	4 2	.. ..	1 0	.. ..	.. ..	0 2	.. ..	.. ..	.. ..	51	26	25	49.1	12	9
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	10
.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	3	3	0	0.0	3	11
.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	12
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	13
.. .. 0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	14
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	1 3	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	7	2	5	71.4	3	15
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	1 0	4	4	0	0.0	4	16
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	17
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	3	0	0.0	3	18
.. .. 2 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	7	6	1	14.3	4	19
.. .. 5 0	.. ..	3 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	4 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	6 2	.. ..	.. ..	.. ..	23	21	2	8.7	7	20
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	3	3	0	0.0	3	21
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	22
.. .. 1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	2	1	33.3	2	23
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	24
.. .. 2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	11	9	2	18.2	5	25
0 2 2 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	1 0	10	6	4	40.0	7	26
.. .. 0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	27
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 2	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	9	6	3	33.3	4	28
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	29
.. .. 1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	4	3	1	25.0	3	30
.. .. 1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	1	2	66.7	2	31
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	3	3	0	0.0	2	32
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	33
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	34
.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	3	2	1	33.3	3	35
.. .. 1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	2	0	0.0	2	36
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5	5	0	0.0	4	37
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	2	1	33.3	3	38
.. .. 2 1	1 1	.. ..	.. ..	.. ..	1 0	0 1	.. ..	.. ..	.. ..	.. ..	3 2	.. ..	5 0	.. ..	.. ..	.. ..	3 2	1 0	.. ..	.. ..	2 0	72	40	32	44.4	13	39
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	0 6	.. ..	1 1	.. ..	1 0	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	15	5	10	66.7	7	40
6 2 0 2	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4 8	.. ..	2 3	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	23	11	23	67.6	9	41
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 2	.. ..	1 1	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	10	6	4	40.0	4	42
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	1	2	66.7	2	43
.. .. 1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5	5	0	0.0	4	44
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4 3	.. ..	.. ..	.. ..	2 1	.. ..	.. ..	3 2	.. ..	.. ..	0 2	25	17	8	32.0	4	45
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	4	1	3	75.0	4	46
.. ..	1 0	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	3	1	25.0	3	47
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	2	2	0	0.0	2	48
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	49
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	2	2	0	0.0	2	50
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	51
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	3	2	1	33.3	2	52
.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	3	0	0.0	3	53
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	2	0	0.0	2	54
.. .. 1 0	.. ..	1 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	14	14	0	0.0	9	55
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	4	0	0.0	3	56
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	57
2 0 1 0	.. ..	1 0	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	8	7	1	12.5	6	58
.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	0 2	1 0	.. ..	.. ..	2 5	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	15	6	9	60.0	7	59
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	5	2	3	60.0	5	60
.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	2	2	0	0.0	2	61
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5	4	1	20.0	1	62
4 3	.. ..	1 0	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	2 9	.. ..	3 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	27	14	13	48.1	7	63
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	64
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	65
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	

Marginal Number	SCHOOL	1 Alabama P	1 Alabama F	2 Arizona P	2 Arizona F	3 California P	3 California F	4 Colorado P	4 Colorado F	5 Connecticut P	5 Connecticut F	6 Delaware P	6 Delaware F	7 Dist. of Columbia P	7 Dist. of Columbia F	8 Florida P	8 Florida F	9 Georgia P	9 Georgia F	10 Illinois P	10 Illinois F	11 Indiana P	11 Indiana F	12 Iowa P	12 Iowa F	13 Kansas P	13 Kansas F	14 Louisiana P	14 Louisiana F
	GERMANY																												
66	Friedrich-Wilhelms-Universitat, Berlin	..	..	..	..	1	1	..	..	..	..	1	0	..	..	..	..	..	..	1	1	..	..	1	0	..	..	..	..
67	Rheinische Friedrich-Wilhelms Universitat, Bonn	..	..	..	..	2	0	..	..	..	..	..	..	..	..	0	1	..	..	4	6	..	..	..	..	..	..	..	..
68	Schlesische-Friedrich-Wilhelms Universitat, Breslau	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
69	Friedrich-Alexanders-Universitat, Erlangen	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	8	7	..	..	0	1	..	..	..	..
70	Albert-Ludwigs-Universitat, Freiburg	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..	..	..
71	Hessische Ludwigs-Universitat, Giessen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
72	Georg-August-Universitat, Gottingen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
73	Ernst-Moritz-Arndt Universitat, Greifswald	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
74	Martin Luther Universitat, Halle-Wittenberg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
75	Universitat Heidelberg	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..	5	12	..	..	..	..	..	..	..	..
76	Thuringische Landesuniversitat, Jena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
77	Christian-Albrechts-Universitat, Kiel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
78	Albertus-Universitat, Konigsberg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
79	Universitat Leipzig	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
80	Philipps-Universitat, Marburg	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	3	6	..	..	..	..	..	..	..	..
81	Ludwig-Maximilians-Universitat, Munchen	..	..	..	..	4	4	..	..	..	..	..	..	..	..	1	0	..	..	17	2	..	..	..	..	..	..	..	..
82	Universitat Rostock	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
83	Eberhard-Karls-Universitat, Tubingen	..	..	..	..	4	0	..	..	..	..	..	..	..	..	..	..	..	..	6	7	..	..	0	1	..	..	..	..
84	Julius-Maximilians-Universitat, Wurzburg	..	..	1	1	1	0	..	..	..	..	..	..	..	..	..	..	..	..	4	0	..	..	..	..	..	..	..	..
85	Hamburgische Universitat, Hamburg	..	..	..	..	4	0	..	..	..	..	..	..	..	..	..	..	..	..	1	5	..	..	..	..	..	..	..	..
86	Universitat Koln	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	..	..	..	..	..	..
87	Johann Wolfgang Goethe-Universitat, Frankfurt-am-Main	..	..	..	..	3	0	..	..	..	..	..	..	..	..	1	0	..	..	4	7	..	..	..	..	..	..	..	..
88	Westfalischen Wilhelms-Universitat, Munster	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..
89	Medizinische Akademie Dusseldorf	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	6	4	..	..	..	..	..	..	..	..
90	Medizinische Fakultat der Johannes Guttenberg-Universitat, Mainz	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
91	Humboldt University Medical School, Berlin	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
92	University of Jena Medical School, Friedrich Schiller University	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	GREECE																												
93	National University of Athens	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	2	7	..	..	..	..	..	..	..	..
	GUATEMALA																												
94	Universidad Nacional de Guatemala	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	HAITI																												
95	Ecole Nationale, Port-au-Prince	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	7	..	..	..	..	..	..	..	..
	HUNGARY																												
96	Magyar Kiralyi Pazmany Petrus Tudomanyegyetum, Budapest	..	..	..	..	2	0	..	..	0	2	..	..	..	..	..	..	..	..	2	4	..	..	..	..	..	..	..	..
97	Magyar Kiralyi Ferency Josef Tudomanyegyetum, Szeged	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	0	1	..	..	..	..	..	..	..	..
98	Magyar Kiralyi Erzebet Tudomanyegyetum, Pecs	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
99	Magyar Kiralyi Tisza-Istvan Tudomanyegyetum, Debrecen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ICELAND																												
100	Haskoli Islands Laee Knadeildin, Reykjavik	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
	INDIA																												
101	University of Bombay	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
102	University of Madras Medical College	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	IRAN																												
103	Madresseh Teb, Teheran	..	..	..	..	2	0	..	..	..	..	..	..	..	..	0	2	..	..	1	1	..	..	..	..	..	..	..	..
104	American School Medical Department, Urmia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..
	IRAQ																												
105	Royal Iraq Medical College, Bagdad	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	IRELAND																												
106	Queen's University, Belfast	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
107	National University of Ireland	..	..	..	..	0	..	..	..	1	1	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..	..	..
108	University of Dublin	..	..	..	..	1	0	..	..	2	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
109	Schools of Surgery, Royal College of Surgeons in Ireland, Dublin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
110	Licentiate of the Royal College of Physicians of Ireland and Licentiate of the Royal College of Surgeons in Ireland	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
111	Licentiate of the Royal College of Surgeons, Ireland	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
112	Licentiate of the Apothecaries' Hall, Dublin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	ITALY																												
113	Regia Universita di Bologna	..	..	..	..	1	1	..	..	0	1	..	..	..	..	2	0	..	..	5	1	..	..	2	0	..	..	..	..
114	Regia Universita di Milano	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
115	Regia Universita di Catania	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
116	Regia Universita di Genova	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
117	Regia Universita di Messina	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
118	Regia Universita di Modena	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
119	Regia Universita di Napoli	..	..	..	..	1	0	..	..	0	1	..	..	..	..	..	..	..	..	1	3	..	..	..	..	..	..	..	..
120	Regia Universita di Padova	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
121	Regia Universita di Palermo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
122	Regia Universita di Pavia	..	..	..	..	1	0	..	..	..	..	..	..	..	..	0	1	..	..	0	1	..	..	..	..	..	..	..	..
123	Regia Universita di Perugia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
124	Regia Universita di Pisa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
125	Regia Universita di Roma	..	..	..	..	2	1	..	..	1	0	..	..	..	..	..	..	..	..	1	7	..	..	..	..	..	..	..	..
126	Regia Universita di Sassari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
127	Regia Universita di Siena	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..
128	Regia Universita di Torino	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..
129	Regia Universita di Bari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
130	Regia Universita degla Studi di Cagliari	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..
	JAPAN																												
131	Okayama Medical College	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
132	Keio Gijuku University Medical College, Tokyo	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
133	Japan University Medical Department, Kanda, Tokyo	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	LATVIA																												
134	Latvijas Universitate, Riga	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	4	2	..	..	..	..	..	..	..	..
	LEBANON																												
135	American University of Beirut	..	..	..	..	4	0	..	..	..	..	..	..	..	..	3	0	..	..	..	..	..	..	..	..	..	..	..	..
136	Faculte Francaise de l'Universite de St. Joseph, Beyrouth	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	LITHUANIA																												
137	Vytauto Didzijo Universiteto, Kaunas	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	13	..	..	..	..	..	..	..	..
	MANCHUKUO																												
138	Mukden Medical College, Mukden	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
	Marginal Number	1		2		3		4		5		6		7		8		9		10		11		12		13		14	

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Nebraska	New Hampshire	New Jersey	New Mexico	New York	North Dakota	Ohio	Pennsylvania	Rhode Island	South Dakota	Texas	Virginia	Washington	Wisconsin	Alaska, Hawaii, Puerto Rico, Virgin Islands	Totals	Examined—Passed	Examined—Failed	% Failed	Number of Boards Examined by	Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
1 1	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 9	.. ..	3 1	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	26	13	13	50.0	9	66
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	12	11	1	8.3	5	67
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	2	1	33.3	2	68
.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5 3	.. ..	4 1	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	33	21	12	36.4	7	69
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	7	7	0	0.0	3	70
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	71
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	6	3	3	50.0	3	72
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	73
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	1	74
.. ..	1 0	.. ..	1 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	1 0	6 0	.. ..	6 1	.. ..	.. ..	0 1	.. ..	.. ..	1 0	41	26	15	36.6	11	75
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	1	2	66.7	2	76
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	2	0	0.0	2	77
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	2	0	0.0	2	78
0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 4	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	9	2	7	77.8	4	79
.. ..	2 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	17	8	9	52.9	5	80
0 1	1 3	0 1	4 0	.. ..	.. ..	2 1	.. ..	.. ..	1 0	.. ..	1 0	.. ..	15 1	.. ..	3 1	.. ..	.. ..	1 2	.. ..	.. ..	.. ..	84	50	34	40.5	13	81
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	2	1	33.3	3	82
.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	3 0	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	24	15	9	37.5	7	83
1 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 1	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	14	12	2	14.3	7	84
.. ..	1 0	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	3 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	18	11	7	38.9	6	85
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	7	4	3	42.9	3	86
.. ..	0 4	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 1	.. ..	8 0	.. ..	1 1	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	34	22	12	35.3	10	87
.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	2 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	8	4	4	50.0	4	88
.. ..	1 0	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	18	13	5	27.8	7	89
.. ..	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	2	1	33.3	2	90
.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	2	1	33.3	3	91
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	92
3 4	3 0	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 1	.. ..	1 0	.. ..	1 0	.. ..	1 0	2 1	.. ..	.. ..	.. ..	31	17	14	45.2	10	93
.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	3	0	3	100.0	3	94
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	9	1	8	88.9	2	95
0 2	0 3	0 1	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 6	.. ..	5 6	.. ..	.. ..	1 1	.. ..	1 0	.. ..	.. ..	.. ..	39	14	25	64.1	11	96
1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 2	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	9	5	4	44.4	5	97
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 2	.. ..	2 1	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	6	2	4	66.7	3	98
.. ..	1 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 2	.. ..	3 0	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	9	4	5	55.6	4	99
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	2	0	0.0	2	100
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	101
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	102
3 3	1 0	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	4 4	.. ..	.. ..	.. ..	21	12	12	50.0	9	103
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	104
.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	5	4	1	20.0	3	105
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5	5	0	0.0	3	106
6 2	2 0	1 0	1 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	23	20	3	13.0	10	107
4 0	1 0	0 1	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	12	11	1	8.3	8	108
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	109
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	2	110
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	111
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	112
1 2	0 1	1 1	1 0	1 0	.. ..	.. ..	.. ..	.. ..	6 0	.. ..	8 ''	.. ..	6 5	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	62	35	27	43.5	15	113
0 3	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 3	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	8	1	7	87.5	4	114
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	115
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 2	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	2	2	50.0	3	116
.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	2	117
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	1	3	75.0	4	118
2 4	0 1	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4 0	.. ..	2 12	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	35	12	23	65.7	10	119
0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 3	.. ..	3 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	10	4	6	60.0	3	120
0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	2 2	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	9	5	4	44.4	5	121
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	1	2	66.7	3	122
0 1	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	2	123
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1 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	5 8	.. ..	3 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	33	15	18	54.5	7	125
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	1	126
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	127
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	1 3	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	12	5	7	58.3	6	128
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	0 4	.. ..	1 0	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	8	2	6	75.0	4	129
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	0	2	100.0	1	130
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	2	1	1	50.0	2	131
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	132
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	133
1 2	1 0	.. ..	1 0	1 1	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	3 12	.. ..	5 5	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	42	19	23	54.8	10	134
.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5 2	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	3 0	.. ..	.. ..	.. ..	19	17	2	10.5	6	135
0 3	1 0	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	9	4	5	55.6	5	136
.. ..	0 1	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 7	.. ..	4 3	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	39	15	24	61.6	5	137
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	138
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	

Marginal Number	SCHOOL	1 Alabama P	1 Alabama F	2 Arizona P	2 Arizona F	3 California P	3 California F	4 Colorado P	4 Colorado F	5 Connecticut P	5 Connecticut F	6 Delaware P	6 Delaware F	7 Dist. of Columbia P	7 Dist. of Columbia F	8 Florida P	8 Florida F	9 Georgia P	9 Georgia F	10 Illinois P	10 Illinois F	11 Indiana P	11 Indiana F	12 Iowa P	12 Iowa F	13 Kansas P	13 Kansas F	14 Louisiana P	14 Louisiana F
	MEXICO																												
139	Universidad Nacional, Mexico City	..	..	..	..	3	2	..	..	..	..	..	..	..	..	1	0	..	..	1	5	..	..	..	..	..	..	..	..
140	Escuela de Medicine de Nuevo Leon, Monterrey	..	..	..	..	1	2	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..
141	Universidad de Guadalajara	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
142	Escuela Medico Militar, Mexico City	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..
143	Escuela de Medicine de Yucatan, Merida	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
144	National Homeopathic Medical School, Mexico City	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..
145	National Autonomous University of Mexico, Mexico City	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
146	Escuela Nacional de Medicine Homeopatica del Instituto Politecnico Nacional, Mexico City	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NETHERLANDS																												
147	Universiteit van Amsterdam	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	1	2	..	..	..	..	..	..	..	..
148	Rijks-Universiteit te Leiden	..	..	..	..	1	0	..	..	1	0	..	..	..	..	1	0	1	0	1	2	..	..	1	0	..	..	..	..
149	Rijks-Universiteit te Utrecht	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
	NICARAGUA																												
150	Universidad de Nicaragua Facultades de Medicine en Leon y en Granada	..	..	..	..	0	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NEW ZEALAND																												
151	University of New Zealand, Dunedin	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	NORWAY																												
152	Kongelige Frederiks Universitet, Oslo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	PERU																												
153	Universidad Mayor de San Marcos de Lima Facultad de Medicina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..
	PHILIPPINES																												
154	University of Santo Tomas, Manila	..	..	..	..	1	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
155	University of the Philippines, Manila	..	..	..	..	3	1	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
156	College of Medicine, Manila Central University, Manila	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	POLAND																												
157	Uniwersytet Jagiellonski Wydzial Lekarski, Cracow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
158	Uniwersytet Jana Kazimierza Wydzial Lekarski, Lwow (Lemberg)	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	3	3	..	..	..	..	..	..	..	..
159	Uniwersytet Jozefa Pilsudskiego, Warsaw	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
160	Uniwersytet Poznanski Wydzial Lekarski, Poznan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
161	Uniwersytet Stefana Batorego Wydzial Lekarski, Wilno	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
	RUMANIA																												
162	Universitatea din Bucuresti	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
163	Universitatea din Cluj	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
164	Facultatea de Medicina, Universitatea de Vest, Timisioara	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SCOTLAND																												
165	University of Aberdeen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
166	University of St. Andrew's, St. Andrew and Dundee	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
167	University of Glasgow	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
168	Licentiate of the Royal College of Physicians of Edinburgh, Licentiate of the Royal College of Surgeons of Edinburgh, Licentiate of the Royal Faculty of Physicians and Surgeons of Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..
169	Polish School of Medicine, Edinburgh	..	..	..	..	1	0	..	..	0	1	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..
	SOUTH AFRICA																												
170	University of Witwatersrand, Johannesburg	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
171	University of Cape Town, Cape Town	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SPAIN																												
172	Universidad de Barcelona	..	..	..	..	0	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
173	Universidad Central de Espana, Madrid	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
174	Universidad of Santiago	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
175	Universidad de Zaragoza Facultad de Medicina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
176	Universidad de Salamanca Facultad de Medicina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	SWEDEN																												
177	Kungl, Karolinska Universitetet Medicinska Fakulteten, Lund	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
	SWITZERLAND																												
178	Universitat Basel	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
179	Universitat Bern	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
180	Universite de Geneve	..	..	..	..	4	0	3	0	..	..	..	..	1	0	1	2	..	..	2	0	..	..	..	..	..	..	..	..
181	Universite de Lausanne	..	..	1	0	1	0	..	..	1	0	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..
182	Universitat Zurich	..	..	..	..	2	0	..	..	2	1	..	..	..	..	2	0	1	0	3	1	..	..	..	..	..	..	..	..
	SYRIA																												
183	Faculty of Medicine Syrian University, Damascus	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	TURKEY																												
184	University of Istanbul	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
185	Ankara University	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	UNION OF SOCIALIST SOVIET REPUBLICS																												
186	First Leningrad Medical Institute, Leningrad	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
187	Voronezh Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
188	Kazan Medical Institute Kazan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
189	Kharkov Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	2	..	..	..	..	..	..	..	..
190	Kiev Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
191	Odessa Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
192	University of Tomsk Faculty of Medicine	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
193	Dnepropetrovsk Medical Institute, Dnepropetrovsk	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
194	Severo-Kavka Medical Institute, Rostov-on-the-Don	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
195	First Moscow Medical Institute	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..
196	State Medical Institute of Vinitza, Vinitza	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
197	Stalino Institute of Medicine, Stalino	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	YUGOSLAVIA																												
198	Zagrebaska Universiteta, Zagreb	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..
199	Beogradskog Universiteta, Beograd	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	0	3	..	..	..	..	..	..	..	..
200	Totals	2		3		181		3		29		2		2		40		2		362		4		8		3		1	
201	Totals, Examined, Passed	1		2		135		3		13		1		2		27		2		157		2		4		3		1	
202	Totals, Examined, Failed	1		1		46		0		16		1		0		13		0		205		2		4		0		0	
203	Percentage Failed	50.1		33.3		34.1		0.0		55.2		50.0		0.0		48.1		0.0		56.6		50.0		50.0		0.0		0.0	
	Marginal Number	1		2		3		4		5		6		7		8		9		10		11		12		13		14	

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Nebraska	New Hampshire	New Jersey	New Mexico	New York	North Dakota	Ohio	Pennsylvania	Rhode Island	South Dakota	Texas	Virginia	Washington	Wisconsin	Alaska, Hawaii, Puerto Rico, Virgin Islands	Totals	Examined—Passed	Examined—Failed	% Failed	Number of Boards Examined by	Marginal Number
P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F	P F						
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.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	3	2	1	33.3	3	141
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	3	2	1	33.3	2	142
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	143
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	2	0	2	100.0	2	144
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3 0	2 0	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	19	17	2	10.5	12	148
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 0	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	7	6	1	14.3	4	149
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	0	3	100.0	1	150
.. ..	1 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	2	0	0.0	2	151
.. ..	.. ..	.. ..	.. ..	3 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	3	0	0.0	1	152
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	3	1	25.0	2	153
.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	10	4	6	60.0	4	154
1 0	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	7	6	1	14.3	4	155
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	2	0	0.0	1	156
.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	2 3	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	9	5	4	44.4	5	157
.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	5 10	1 0	1 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	28	12	16	57.1	7	158
.. ..	1 1	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	1 0	.. ..	3 6	.. ..	2 1	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	18	7	11	61.1	7	159
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 4	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	6	0	6	100.0	3	160
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	2	2	50.0	3	161
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	162
.. ..	1 0	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3	3	0	0.0	3	163
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	164
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	1	1	50.0	1	165
.. ..	.. ..	.. ..	3 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	5	4	1	20.0	3	166
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5	5	0	0.0	2	167
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	0	2	100.0	2	168
0 1	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 0	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	11	7	4	36.3	7	169
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	170
.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	2	0	0.0	2	171
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	1 1	.. ..	.. ..	2 0	7	4	3	42.9	4	172
.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	5	3	2	40.0	3	173
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3 0	4	3	1	25.0	2	174
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	1	1	0	0.0	1	175
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	1	1	0	0.0	1	176
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	177
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	1 2	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	8	5	3	37.5	5	178
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 4	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	9	5	4	44.4	5	179
.. ..	2 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	9 5	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	32	25	7	21.9	9	180
.. ..	1 0	0 1	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	7 5	.. ..	2 1	2 6	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	26	18	8	30.8	11	181
.. ..	.. ..	.. ..	.. ..	.. ..	1 0	1 0	.. ..	1 0	.. ..	.. ..	5 1	.. ..	3 0	2 0	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	27	24	3	11.1	12	182
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	183
1 2	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2 0	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	8	5	3	37.5	4	184
1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	2	2	0	0.0	2	185
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	2	0	0.0	2	186
.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	2	2	50.0	3	187
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	188
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5	1	4	80.0	2	189
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	0	2	100.0	2	190
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 2	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	4	1	3	75.0	3	191
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2	0	2	100.0	2	192
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	1	0	1	100.0	1	193
.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	194
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 3	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	5	1	4	80.0	3	195
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	1	0	0.0	1	196
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1	0	1	100.0	1	197
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	0 1	.. ..	1 1	.. ..	1 0	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	5	3	2	40.0	4	198
.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1 0	.. ..	1 1	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	7	3	4	57.1	3	199
88	81	26	41	18	2	19	2	4	26	4	383	5	225	7	47	5	24	89	5	2	32	1,777	..	..	....	..	2.0
44	55	11	40	17	2	14	0	3	23	4	159	5	160	6	35	4	16	54	5	2	30	...	1,042	..	....	..	201
44	26	15	1	1	0	5	2	1	3	0	224	0	65	1	12	1	8	35	0	0	2	...	..	735	....	..	202
50.0	32.1	57.8	2.4	5.6	0.0	26.3	100.0	25.0	11.5	0.0	58.5	0.0	28.9	14.3	25.5	20.0	33.3	39.3	0.0	0.0	6.2	...	..	..	41.4	..	203
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	

Temporary and Educational Permits, Limited and Temporary Licenses, or Other Certificates Issued by Medical Licensing Boards

Thirty-one medical licensing boards make provision for the issuance of temporary and educational permits, limited and temporary licenses, or other certificates in lieu of regular medical licensure for the practice of medicine. The regulations for the issuance of such certificates vary. This limited registration may apply to hospital training, to those ineligible for licensure who seek further educational training, for emergency medical practice, or for regular practice until the next meeting of the board for the issuance of licenses. These states, and the length of validity of this special registration are shown in table 21, page 360.

TABLE 29.—*Physicians Examined on the Basis of Credentials Obtained in Countries Other Than the United States and Canada, 1930-1955*

Year	Number Examined	Passed	Percentage Failed
1930	167	92	44.9
1931	158	91	42.4
1932	182	96	47.3
1933	200	129	35.5
1934	285	170	40.2
1935	437	303	30.7
1936	588	382	35.0
1937	920	637	30.8
1938	1,164	716	38.5
1939	1,691	839	50.4
1940	2,088	948	54.7
1941	1,717	698	59.2
1942	1,630	890	45.4
1943	1,031	518	49.8
1944	691	325	53.0
1945	475	209	56.0
1946	495	221	55.3
1947	601	283	52.9
1948	639	311	51.3
1949	737	319	56.7
1950	799	359	55.0
1951	1,006	524	47.9
1952	1,208	648	46.3
1953	1,463	796	46.3
1954	1,642	943	42.6
1955	1,771	1,042	41.4
Totals	23,785	12,489	47.4

Required Internships

Five approved medical schools require the completion of a one year internship as a prerequisite for the M.D. degree. Currently, Duke University School of Medicine is the only school in the United States that specifies the internship requirement but does not withhold the degree until the internship is completed. The degree is issued at the end of the four-year medical course, but the school obtains from each student a signed agreement that he will spend two years in training in a hospital or laboratory before entering practice. The schools exacting this requirement are listed in table 22, p. 360.

One year of internship, as a prerequisite to licensure, is required by the licensing boards of 26 states, the District of Columbia, Alaska, the Canal Zone, Hawaii, and Puerto Rico. Kansas and South Carolina this year reported that the internship was not a requirement for licensure. Twelve boards specify that the internship must be a rotating service. Arizona no longer indicates that a rotating service is desirable. New Jersey reported that a one-year general rotating internship or a two-year residency in a specialty will meet the board's requirement. Alaska will accept active practice for four years in lieu of the internship requirement. Those licensing boards that require an internship for licensure are listed in table 23, page 360.

Schedule of Written Examination Dates and Reciprocity Meetings

The schedule of state licensing boards for written examinations for medical licensure and meetings or oral examinations for the issuance of licenses by reciprocity and/or endorsement of credentials is given in table 24, p. 361. To meet the demands for licensure in recent years as a result of the increase in the number of candidates seeking licensure, examination dates and reciprocity meetings have been scheduled at more frequent intervals. In those states requiring a basic science certificate for licensure, these dates are arranged to coincide closely with the examination and meeting dates of the boards of examiners in the basic sciences. In some states temporary permits are granted enabling physicians to begin the practice of medicine immediately.

Medical License Fees

The fee charged by the medical licensing boards for registration by examination and also by reciprocity or endorsement of credentials is given in table 25, p. 361. The examination fee is somewhat uniform throughout the country, the majority of the boards charging a fee of $25. The fee for a license by reciprocity or endorsement of credentials varies from $20 to $200. Four states, Arkansas, Maryland, New York, and Wisconsin reported an increase in the fee charged for the written examination, and one state, New York, an increase in the fee charged for a license without written examination. The District of Columbia and Tennessee have a lower fee for those being certified on the basis of the certificate of the National Board of Medical Examiners than for candidates licensed by endorsement of state licenses.

Licensure on Government Credentials

In most of the states no provision is made in the medical practice act for the acceptance of government credentials as a basis for licensure without examination. Nine state licensing boards have indicated that in their discretion they may accept such credentials under varying regulations, but mainly the recognition is accorded to officers who obtained their commissions after examination. These states are Alabama, California, Delaware, Illinois, Pennsylvania, Texas, Utah, Vermont, and Wisconsin.

Annual Registration

Thirty-four states, the District of Columbia, Alaska, Guam, Hawaii, and the Virgin Islands require physicians to register their licenses annually or biennially. In table 26 (page 361) are listed the licensing boards that exact this requirement and the fee charged for such registration. Some of these states require such registration whether or not the physicians reside in the state. The fee charged ranges from $1 to $10. Seven states have a non-

resident fee. In Florida physicians are required to register with the State Board of Health, while Missouri, New York, and West Virginia require biennial registration.

Licensure of Foreign-Trained Physicians

Since February, 1950, the Council on Medical Education and Hospitals of the American Medical Association and the executive council of the Association of American Medical Colleges have published a list of foreign medical schools whose graduates they recommend for consideration on the same basis as graduates of approved medical schools in the United States. This is offered as an advisory list for the use of any agency or organization that may find it helpful. The current list, revised in February, 1953, is contained in this section. The position of the council with respect to schools not named in the list is that they neither approve nor disapprove such schools. The credentials of graduates of schools not listed must be evaluated by those other agencies, licensing boards, organizations, or institutions to whom graduates of the schools

TABLE 30.—FOREIGN-TRAINED PHYSICIANS LICENSED BY STATE BOARDS, 1946-1955

	Examination							Endorsement							Grand Totals
	1946-1950	1951	1952	1953	1954	1955	Total	1946-1950	1951	1952	1953	1954	1955	Total	
Alabama	1	0	2	1	2	1	7	1	1	1	0	0	0	3	10
Arizona	0	1	1	1	0	2	5	4	0	0	0	1	4	9	14
Arkansas	1	0	0	0	0	0	1	1	0	0	0	0	1	2	3
California	135	56	98	95	83	135	602	47	1	1	0	1	0	50	652
Colorado	35	3	1	1	1	3	44	0	0	0	0	0	0	0	44
Connecticut	27	13	7	21	13	13	94	58	6	4	9	19	23	119	213
Delaware	0	1	2	1	1	1	6	2	1	2	0	3	0	8	14
District of Columbia	17	6	2	2	6	2	35	40	8	4	6	14	10	82	117
Florida	27	8	14	11	13	27	100	0	0	0	0	0	0	0	100
Georgia	7	4	2	6	6	2	27	3	1	1	2	3	3	13	40
Idaho	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Illinois	142	92	153	208	216	157	968	0	0	0	0	3	0	3	971
Indiana	3	0	0	0	20	2	25	4	1	2	0	16	4	27	52
Iowa	3	1	3	10	5	4	26	21	1	5	3	2	1	33	59
Kansas	4	0	1	0	1	3	9	0	0	0	0	0	0	0	9
Kentucky	1	0	0	0	0	0	1	1	1	0	0	1	0	3	4
Louisiana	0	0	0	1	3	1	5	0	0	0	0	0	0	0	5
Maine	11	0	4	13	16	44	88	5	2	3	2	7	6	25	113
Maryland	55	18	31	30	44	55	233	6	0	0	0	1	0	7	240
Massachusetts	32	6	10	10	7	11	76	5	2	1	1	4	2	15	91
Michigan	2	4	10	15	25	40	96	5	0	1	5	7	17	35	131
Minnesota	10	7	10	23	17	17	84	0	0	0	0	0	0	0	84
Mississippi	5	1	1	0	1	2	10	2	0	0	0	0	0	2	12
Missouri	23	8	5	3	4	14	57	2	3	0	0	1	0	6	63
Montana	0	1	0	0	0	0	1	0	1	1	0	1	0	3	4
Nebraska	3	0	0	0	0	0	3	6	0	0	1	1	0	8	11
Nevada	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
New Hampshire	5	0	2	1	4	3	15	14	4	1	1	6	3	29	44
New Jersey	25	7	3	6	19	23	83	133	16	21	25	24	22	241	324
New Mexico	1	0	1	0	3	4	9	10	1	1	4	1	1	18	27
New York	722	192	171	172	184	159	1,600	183	18	31	15	8	7	262	1,862
North Carolina	6	1	4	11	8	0	30	2	0	1	2	1	2	8	38
North Dakota	10	8	6	1	0	5	30	0	0	0	0	0	0	0	30
Ohio	45	46	34	66	117	160	468	102	27	23	26	48	47	283	751
Oklahoma	1	1	0	0	0	0	2	1	1	0	1	1	1	5	7
Oregon	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1
Pennsylvania	26	3	6	7	12	6	60	0	0	0	0	0	0	0	60
Rhode Island	13	7	23	26	34	35	138	1	0	1	0	1	1	4	142
South Carolina	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1
South Dakota	9	3	5	1	2	4	24	1	0	0	0	0	0	1	25
Tennessee	5	0	1	0	1	0	7	0	2	0	1	0	0	3	10
Texas	22	4	6	18	14	16	80	27	1	0	0	0	3	31	111
Utah	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vermont	1	0	0	0	0	0	1	2	1	0	0	2	3	8	9
Virginia	7	10	8	14	23	54	116	12	1	3	0	0	0	16	132
Washington	14	1	4	2	5	5	31	4	2	3	4	4	6	23	54
West Virginia	0	4	1	4	1	0	10	0	0	0	0	0	0	0	10
Wisconsin	0	2	3	1	3	2	11	2	1	1	0	3	1	8	19
Wyoming	0	0	0	0	0	0	0	2	0	0	0	0	0	2	2
U.S. Possessions and Territories	32	5	13	13	29	30	122	14	4	3	3	3	0	27	149
Totals	1,489	524	648	796	943	1,042	5,442	723	108	115	121	188	168	1,423	6,865

apply for recognition. Fifty schools in 14 countries are included in the present listing (p. 362).

In 1954 there was formed a Cooperating Committee on Graduates of Foreign Medical Schools, including representation from the Federation of State Medical Boards of the United States, the Council on Medical Education and Hospitals of the American Medical Association, the Association of American Medical Colleges, and the American Hospital Association. This cooperating committee after careful deliberation has developed a proposal for an evaluation service for foreign medical graduates that has been approved in principle by the parent organizations represented on the committee. It is anticipated that the mechanism to conduct this evaluation service can be definitely formulated during the course of the next year. Details of this evaluation service will appear in a later issue of THE JOURNAL.

TABLE 31.—*Graduates of Foreign Medical Faculties Representing Additions to the Medical Profession, 1955*

	Examination	Reciprocity and Endorsement	Total
Alabama	1	0	1
California	121	0	121
Colorado	2	0	2
Connecticut	13	4	17
Delaware	1	0	1
District of Columbia	0	8	8
Florida	9	0	9
Georgia	2	0	2
Illinois	145	0	145
Indiana	1	0	1
Iowa	5	0	5
Kansas	2	0	2
Maine	44	2	46
Maryland	33	0	33
Massachusetts	5	1	6
Michigan	43	1	44
Minnesota	17	0	17
Mississippi	2	0	2
Missouri	5	0	5
New Hampshire	2	0	2
New Jersey	24	0	24
New Mexico	3	0	3
New York	131	4	135
North Dakota	1	0	1
Ohio	151	3	154
Pennsylvania	4	0	4
Rhode Island	27	0	27
South Dakota	1	0	1
Texas	8	0	8
Virginia	42	0	42
Washington	4	3	7
Wisconsin	2	0	2
Alaska	2	0	2
Puerto Rico	27	0	27
Virgin Islands	1	0	1
Totals	881	26	907

The current requirements for foreign-trained physicians seeking medical licensure in the United States and its territories and outlying possessions are given in table 27.

Twenty licensing boards limit licensure of foreign-trained physicians to those who have graduated from schools included in the listing. Other boards find the list useful in the evaluation of credentials. Foreign-trained physicians are not eligible for licensure by 12 boards. Six boards do not require citizenship, while 23 boards require full citizenship. Thirteen boards require that the applicant declare his intention of becoming a citizen. Twenty-nine boards reported that the foreign-trained physician must serve an internship or obtain further medical training in the United States. In addition to the items tabulated in table 27, 18 boards have other specific requirements for foreign-trained physicians and 16 boards have varying exemptions. The factual data pertaining to these regulations are included in the text immediately below the table.

This table was developed in an effort to assist the foreign-trained physician seeking licensure in the United States. While an attempt has been made to present the situation as it exists, the table is intended to give only a summary of existing requirements. Persons interested in licensure should supplement these data by communicating with the licensing boards. Medical licensure in the United States is a "state right" and is entirely under the jurisdiction of the governments of the individual states. The power to license physicians is exercised through the medical licensing boards of each state. Official information concerning the acceptability of foreign credentials should be obtained directly from the licensing boards.

The Council also publishes a compendium of information concerning foreign medical schools and the status of foreign medical credentials in the United States that has been prepared as an aid to foreign-trained physicians. In addition to data pertaining to medical licensure, this booklet contains sections pertaining to graduate training in the medical specialties, undergraduate medical study in the United States, and transfer to advanced standing in American medical schools and gives information pertaining to medical study in foreign medical schools.

The number of graduates of foreign medical faculties examined for medical licensure in 1955 is included in table 28. The figures include both American and foreign-born physicians. Graduates of 194 medical schools and 5 licensing corporations were examined. There were 1,777 physicians examined for medical licensure in 35 states, Alaska, Hawaii, Puerto Rico, and the Virgin Islands. Graduates of medical schools in the Philippines, Iceland, New Zealand, 14 South and Central American countries, 24 countries in Europe, and 13 countries in Asia were represented at examinations. Of those examined, 1,042 passed and 735, or 41.4%, failed. More than 50 graduates of the universities of Vienna, Havana, Munich, and Bologna were tested in 1955, and more than 20 graduates of 32 other schools were examined.

TABLE 32.—*Additions to the Medical Profession Representing Graduates of Foreign Medical Faculties, 1950-1955*

Year	Examination	Reciprocity and Endorsement	Totals
1950	267	41	308
1951	425	25	450
1952	545	24	569
1953	662	23	685
1954	749	23	772
1955	881	26	907
Totals	3,529	162	3,691

The greatest number examined by any one state was 383 in New York, of whom 159 passed and 224 (58.5%) failed. Illinois examined 362, of whom 205 (56.6%) failed. Ohio examined 225, with 65 failures; and California examined 181, with 34.1% failures. Twenty or more were tested in 20 other states.

Table 29 presents the number of graduates of faculties of medicine examined for medical licensure in the United States in 26 years (1930-1955). In 1936 the number of foreign-trained physicians seeking licensure in the United States began to increase, and by 1940 there were over three times as many as were tested in 1936. Beginning in 1944 the numbers examined began to decrease, until 1951, when there was a noticeable increase. In each succeeding year the number examined has increased. In 1955 the increase over the previous year was 129. At no time in the 26-year period did fewer than 30% fail in a given year.

In table 30 figures are given for a ten-year period (1946-1955) showing the number of foreign-trained physicians licensed by each state board, both after written examination and by endorsement of credentials. To conserve space, in the first column under examination and under endorsement the figures combine the years 1946 to 1950 inclusive. Thereafter, they are given for each year. While table 28 reflects the candidates registered after examination only and indicates the percentage failing in each year, table 30 records the total licensed in each state. In this ten-year period there were 5,442 licenses issued to foreign-trained physicians after written examination and 1,423 by endorsement of credentials. The total number of such licentiates registered was 6,865.

Represented in table 31 are figures regarding the foreign-trained physicians registered in 1955 who were not previously licensed in the United States and who therefore are additions to the medical profession. There were 907 in this group, of whom 881 were licensed by written examination and 26 by endorsement of credentials. Comparative figures for five previous years together with the figures for 1955 are given in table 32. In this six-year period 3,691 foreign-trained physicians were added to the physician population of the United States, 3,529 obtaining licensure by written examination and 162 by endorsement of credentials.

CORRESPONDING OFFICERS OF BOARDS OF MEDICAL EXAMINERS IN THE UNITED STATES, TERRITORIES, AND OUTLYING POSSESSIONS

Alabama	Dr. D. G. Gill, Secretary, State Office Bldg., Montgomery 4
Arizona	Mr. Robert Carpenter, Executive Secretary, 411 Security Bldg., Phoenix
Arkansas	Dr. Joe Verser, Secretary, Harrisburg
California	Dr. Louis E. Jones, Secretary, 1020 N St., Room 536, Sacramento
Colorado	Mrs. Beulah H. Hudgens, Executive Secretary, 831 Republic Bldg., Denver 2
Connecticut	Dr. Creighton Barker, Secretary, 160 St. Ronan St., New Haven
Delaware	Dr. J. S. McDaniel, Secretary, 225 S. State St., Dover
District of Columbia	Dr. Daniel L. Seckinger, Secretary, 1740 Massachusetts Ave., N.W., Washington
Florida	Dr. Homer L. Pearson, Secretary, 901 N.W. 17th St., Miami 36
Georgia	Mr. C. L. Clifton, Secretary, 111 State Capitol, Atlanta 3
Idaho	Mr. Armand L. Bird, Executive Secretary, 364 Sonna Bldg., Boise
Illinois	Mr. Fredric B. Selcke, Superintendent of Registration, Capitol Bldg., Springfield
Indiana	Dr. Paul R. Tindall, Secretary, 538 K. of P. Bldg., Indianapolis
Iowa	Dr. R. F. Birge, Secretary, 310 Bankers Trust Bldg., Des Moines
Kansas	Dr. Lyle F. Schmaus, Secretary, 772 New Brotherhood Bldg., Kansas City
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Maryland	Dr. Lewis P. Gundry, Secretary-Treasurer, 1215 Cathedral St., Baltimore 1
Massachusetts	Dr Robert C. Cochrane, Secretary, State House, Room 37, Boston 33
Michigan	Dr. E. C. Swanson, Executive Secretary, 118 Stevens T. Mason Bldg., W. Michigan Ave., Lansing 8
Minnesota	Dr. F. H. Magney, Secretary, 230 Lowry Medical Arts Bldg., St. Paul 2
Mississippi	Dr. Felix J. Underwood, Executive Officer, Old Capitol, Jackson 113
Missouri	Mr. John A. Hailey, Executive Secretary, P. O. Box 74, Jefferson City
Montana	Dr. Sidney A. Cooney, Secretary, 7 W. 6th Ave., Helena
Nebraska	Mr. Husted K. Watson, Director, State Capitol Bldg., Room 1009, Lincoln 9
Nevada	Dr. George H. Ross, Secretary, 112 N. Curry St., Carson City
New Hampshire	Dr. John S. Wheeler, Secretary, 107 State House, Concord
New Jersey	Dr. Patrick H. Corrigan, Secretary, 28 W. State St., Trenton
New Mexico	Dr. R. C. Derbyshire, Secretary, 227 E. Palace Ave., Santa Fe
New York	Dr. Stiles D. Ezll, Secretary, 23 S. Pearl St., Albany 7
North Carolina	Dr Joseph J. Combs, Secretary, 716 Professional Bldg., Raleigh
North Dakota	Dr. C. J. Glaspel, Secretary, Grafton
Ohio	Dr. H. M. Platter, Secretary, 21 W. Broad St., Columbus 15
Oklahoma	Dr. E. F. Lester, Secretary, 813 Braniff Bldg., Oklahoma City
Oregon	Dr. Wilmot C. Foster, Secretary, 609 Failing Bldg., Portland 4
Pennsylvania	Mrs. Margaret G. Steiner, Acting Secretary, Box 911, Harrisburg
Rhode Island	Mr. Thomas B. Casey, Administrator, 306 State Office Bldg., Providence
South Carolina	Mr. N. B. Heyward, Secretary, 1329 Blanding St., Columbia
South Dakota	Dr. C. B. McVay, Secretary, Yankton Clinic, Yankton
Tennessee	Dr. H. W. Qualls, Secretary, 1635 Exchange Bldg., Memphis 3
Texas	Dr. M. H. Crabb, Secretary, 1714 Medical Arts Bldg., Fort Worth 2
Utah	Mr. Frank E. Lees, Director, 324 State Capitol Bldg., Salt Lake City 1
Vermont	Dr. F. J. Lawliss, Secretary, Richford
Virginia	Dr. K. D. Graves, Secretary, 631 First St., S.W., Roanoke
Washington	Mr. Edward C. Dohm, Secretary, Olympia
West Virginia	Dr. Newman H. Dyer, Secretary, State Office Bldg. No. 3, Charleston 5
Wisconsin	Dr. Thomas W. Tormey, Jr., Secretary, State Office Bldg., 1 W. Wilson St., Madison
Wyoming	Dr. Franklin D. Yoder, Secretary, State Office Bldg., Cheyenne
Alaska	Dr. W. M. Whitehead, Secretary, 172 S. Franklin St., Juneau
Canal Zone	Dr. Charles O. Bruce, Health Director, Balboa Heights
Guam	Dr. Benedict Cooper, Executive Secretary, Guam Memorial Hospital, Agana
Hawaii	Dr. I. L. Tilden, Secretary, 1020 Kapiolani St., Honolulu
Puerto Rico	Mr. Joaquin Mercado Cruz, Box 9156, Santurce
Virgin Islands	Dr. Earle M. Rice, St. Thomas

BOARD OF EXAMINERS IN THE BASIC SCIENCES

Nineteen states, the District of Columbia, and Alaska have adopted by legislative action basic science requirements underlying the practice of the healing art. A basic science law provides for the establishment of a board of examiners and requires that each person who desires to practice the healing arts appear before the board and demonstrate his knowledge of the basic sciences. These boards have no licensing powers. A certificate of proficiency is issued that is a prerequisite to eligibility to practice.

TABLE 33.—*States Having Basic Science Laws and Year of Enactment*

Alaska	1946	Nevada	1951
Arizona	1936	New Mexico	1941
Arkansas	1929	Oklahoma	1937
Colorado	1937	Oregon	1934
Connecticut	1925	Rhode Island	1940
District of Columbia	1929	South Dakota	1939
Florida	1939	Tennessee	1943
Iowa	1936	Texas	1919
Michigan	1937	Washington	1927
Minnesota	1927	Wisconsin	1925
Nebraska	1927		

The term healing art includes any system, treatment, operation, diagnosis, prescription, or practice for the ascertainment, cure, relief, palliation, adjustment, or correction of any human disease, ailment, deformity, injury, or unhealthy or abnormal physical or mental condition.

The states comprising this group, together with the year of enactment of the basic science law are recorded in table 33. No new basic science law was enacted in 1955.

The subjects in which examinations are conducted are shown in table 34. The subjects are specified by statute.

TABLE 34.—*Subjects Included in Basic Science Examinations*

	Anatomy	Bacteriology	Chemistry	Diagnosis	Hygiene	Pathology	Physiology	Public Health
Alaska	x	x	x	..	x	x	x	..
Arizona	x	x	x	..	x	x	x	..
Arkansas	x	x	x	..	x	x	x	..
Colorado	x	x	x	..	..	x	x	..
Connecticut	x	..	..	x	x	x	x	..
District of Columbia	x	x	x	..	..	x	x	..
Florida	x	x	x	..	..	x	x	..
Iowa	x	x	x	..	x	x	x	..
Michigan	x	x	x	..	..	x	x	..
Minnesota	x	x	x	..	x	x	x	..
Nebraska	x	x	x	..	x	x	x	..
Nevada	x	x	x	..	..	x	x	..
New Mexico	x	x	x	..	..	x	x	..
Oklahoma	x	x	x	..	..	x	x	..
Oregon	x	..	x	..	x	x	x	..
Rhode Island	x	x	x	..	..	x	x	..
South Dakota	x	x	x	..	..	x	x	..
Tennessee	x	x	x	..	..	x	x	..
Texas	x	x	x	..	x	x	x	x
Washington	x	x	x	..	x	x	x	..
Wisconsin	x	..	..	x	..	x	x	..

The boards have no authority to add any subjects or to refrain from examining in any subject, although in some states provision is made for certification by reciprocity, endorsement, waiver, or exemption. The credentials acceptable for certification without examination are listed in table 35.

The results of examinations given and the number of certificates issued on the basis of reciprocity, endorsement, waiver, or exemption during 1955 are presented in tables 36 and 37. A candidate, in applying for a basic science certificate, is not required by law to reveal his school of practice. No attempt has been made to differentiate the schools of the healing arts represented by the candidates examined or certified. Seven states either had

TABLE 35.—*Reciprocity, Endorsement, Waiver, or Exemption Policies of Basic Science Boards*

Credentials Accepted

Alaska
Physicians are accepted on reciprocity from those states with which the board of medical examiners has established reciprocal agreements.

Arizona
Any basic science certificate that has been obtained by an examination before the issuing board and provided that at least four subjects were passed at one sitting. Practitioners licensed in a state requiring a basic science certificate prior to the passage of basic science legislation are eligible on a previous licensure basis.

Arkansas
Reciprocity with all states having basic science boards except Florida and Iowa, with the National Board of Medical Examiners, and with state medical boards each applicant considered individually.

Colorado
(a) Reciprocity with the basic science boards of Arkansas, Nebraska, Nevada, Oklahoma, Oregon, Rhode Island, Tennessee, Texas, and Washington.
(b) Applicants who present certificates from the basic science boards of Connecticut and Wisconsin are examined in bacteriology and chemistry.
(c) Complete reciprocity with the basic science boards of Alaska, Arizona, Iowa, Michigan, Minnesota, New Mexico, and South Dakota is granted to those candidates whose original application to the board in question was made on or before June 1, 1949. Those having made application after that date and holding a certificate must have passed, at one sitting, at least four of the five subjects given by the Colorado Basic Science Board.

Connecticut
No reciprocity. Board at its discretion may waive the examination for applicants who have practiced five years.

District of Columbia
Board may exempt an applicant. All requests are considered individually.

Florida
No reciprocity, waiver, or exemption policies.

Iowa
Credentials from any examining body accepted whose examinations are judged to be equally comprehensive and exhaustive as those given by the Iowa Board.

Michigan
(a) Certificates issued by examination are accepted for registration by waiver from the basic science boards of Alaska, Arkansas, Colorado, District of Columbia, Iowa, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, Rhode Island, South Dakota, Tennessee, and Texas.
(b) Applicants who present certificates from the basic science boards of Michigan and Oregon are examined in bacteriology.
(c) Applicants who present certificates from the Wisconsin Basic Science Board are examined in bacteriology and chemistry.
(d) The Michigan Board of Basic Science Examiners may accept by waiver in lieu of its own examination, the basic science portion of the examination given by any legally constituted examining or licensing board in the healing arts, if such examination is equal or equivalent to the examination given by the Michigan Board.

Minnesota
(a) Reciprocity on an automatic basis with the basic science boards of Arkansas, Colorado, Nebraska, Oregon, and Tennessee (after Feb. 9, 1945), and the National Board of Medical Examiners.
(b) Reciprocity on an individual basis with basic science boards of Alaska, Arizona, Michigan, Nevada, New Mexico, Oklahoma, South Dakota, and Texas.
(c) Reciprocity on an individual basis with the medical licensing boards of Indiana, Kentucky, New York (subsequent to 1925), Oklahoma, Texas, Vermont, and Virginia.
(d) Partial credit granted for grades in certain subjects passed in examinations of medical licensing boards of Alabama, Georgia, Louisiana, New York (subsequent to 1925), North Carolina, and the District of Columbia, and the basic science board of Wisconsin.

Nebraska
No reciprocal agreements exist. Waiver may be granted at the discretion of the Board when certain requirements specified in the law have been met. States eligible for consideration are those states granting exemption from examination to those from Nebraska. In the case of states having a basic science law, the applicant may use as a basis of waiver the results of the basic science examination. In the case of states not having a basic science law or of an applicant who took his licensing examination in a basic science state prior to the existence of the basic science law, such application may be made on the basis of results of the licensing examination.

Nevada
Reciprocity with basic science boards of Arizona, Colorado, District of Columbia, Iowa, Minnesota, New Mexico, Oklahoma, South Dakota, Tennessee, and Texas. Waiver with basic science boards of Arkansas, Florida, Michigan, Nebraska, Oregon, Washington, Wisconsin, and the District of Columbia.

New Mexico
Certificates issued by virtue of written examinations are accepted for reciprocity from basic science boards of Arizona, Arkansas, Colorado, Iowa, Michigan, Minnesota, Nevada, New Mexico, Oklahoma, Oregon, Tennessee, and Wisconsin. Also certificates issued under "Grandfather Clause" to doctors who have been in continuous practice for 30 years.

Oklahoma
Applicants are reviewed on an individual basis. A basic science certificate is not a prerequisite to licensure by reciprocity but is a requirement for licensure by examination.

Oregon
Reciprocity on the basis of written examination with basic science boards of Arkansas, Colorado, Iowa, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, South Dakota, Tennessee, Texas, Washington, and Wisconsin.

TABLE 35.—*Reciprocity, Endorsement, Waiver, or Exemption Policies of Basic Science Boards*—Continued

Credentials Accepted—Continued

Rhode Island
Endorsement after oral examination with Massachusetts Board of Registration in Medicine and basic science boards of Colorado, District of Columbia, and Oklahoma.

South Dakota
Reciprocity with basic science boards of Arizona, Arkansas, Colorado, Iowa, Michigan, Minnesota, Nebraska, Nevada, Oklahoma, Oregon, Tennessee, Texas, Washington, and Wisconsin.

Tennessee
Reciprocity with basic science boards of Arizona, Arkansas, Colorado, District of Columbia, Michigan, Minnesota, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, South Dakota, Texas, and Wisconsin.

Texas
Reciprocity with the basic science boards of Alaska, Arizona, Arkansas, Colorado, Iowa, Michigan, Minnesota, Nebraska, Nevada, Oklahoma, Oregon, South Dakota, Tennessee. Partial reciprocity with Wisconsin.

Washington
Reciprocity on the basis of written examination with all states having basic science boards.

Wisconsin
Waiver or reciprocity to commissioned officers of the armed forces, to an applicant presenting a certificate received by examination from a basic science board, to an applicant who has passed part 1 of the examination of the National Board of Medical Examiners, to a physician licensed to practice medicine in states that do not have a basic science law or who were licensed in a state before the establishment of a basic science board provided he has served an internship or has practiced for at least one year since the license was granted, to a physician licensed in Canada, and to foreign-trained physicians holding an M.D. degree from an acceptable school who are licensed to practice medicine in the country in which the school attended is located.

no failures or did not report figures for failures. The percentage of candidates failing is given for those states that did submit these data.

There were 3,921 candidates examined by the 21 boards in operation in 1955, and certificates of proficiency were issued to 3,474 individuals. In addition, as noted in table 37, 1,936 certificates were issued without examination by 18 boards. The number of applicants registered with or without written examination in 1955 was 5,410. Florida issued 791 such certificates, Texas 727, and Wisconsin 420. Other states certified fewer than 400.

TABLE 36.—*Applicants Examined in Basic Sciences, 1955*

	Examined	Passed	Failed	% Failed
Alaska	5	4	1	20.0
Arizona	56	56	0*	0.0
Arkansas	288	232	56	19.4
Colorado	186	186	0*	0.0
Connecticut	182	172	10	5.5
District of Columbia	10	6	4	40.0
Florida	791	791	0*	0.0
Iowa	144	144	0*	0.0
Michigan	250	186	64	25.6
Minnesota	237	237	0*	0.0
Nebraska	179	131	48	26.8
Nevada	47	22	25	53.2
New Mexico	108	108	0*	0.0
Oklahoma	51	30	21	41.2
Oregon	159	90	69	43.4
Rhode Island	143	110	33	23.1
South Dakota	117	98	19	16.2
Tennessee	228	228	0*	0.0
Texas	213	194	19	8.9
Washington	246	217	29	7.9
Wisconsin	281	232	49	17.4
Totals	3,921	3,474	447	11.1

* Failure data not reported.

Table 38 records the number of candidates certified by basic science boards since 1927. This table indicates for each year the number of boards in operation in a given year, the number of candidates who passed and failed, the number registered without written examination, and the total certified. In this 29-year period, 78,586 certificates have been issued, 54,932 by examination and 23,654 by reciprocity, endorsement, exemption, or waiver. The percentage of failures was 19.9.

The registration or examination fee in the states requiring basic science certification is given in table 39.

TABLE 37.—*Basic Science Certificates Issued by Examination, Reciprocity, Endorsement, Exemption, or Waiver, 1955*

	Certified by		
	Examination	Reciprocity, Endorsement, Exemption, or Waiver	Total Certified
Alaska	4	19	23
Arizona	56	113	169
Arkansas	232	44	276
Colorado	186	101	287
Connecticut	172	0	172
District of Columbia	6	166	172
Florida	791	0	791
Iowa	144	103	247
Michigan	186	209	395
Minnesota	237	135	372
Nebraska	131	21	152
Nevada	22	22	44
New Mexico	108	30	138
Oklahoma	30	1	31
Oregon	90	145	235
Rhode Island	110	4	114
South Dakota	98	11	109
Tennessee	228	91	319
Texas	194	533	727
Washington	217	0	217
Wisconsin	232	188	420
Totals	3,474	1,936	5,410

TABLE 38.—*Candidates for Basic Science Certification, 1927-1955*

	No. of Boards	Examination			Reciprocity, Endorsement, Exemption, or Waiver	Total Certified
		Passed	Failed	% Failed		
1927	5	294	33	10.0	27	321
1928	5	617	88	12.4	19	636
1929	7	641	93	12.6	75	716
1930	7	636	127	16.6	122	758
1931	7	634	153	19.4	141	775
1932	7	634	101	13.7	118	752
1933	8	557	104	15.7	131	688
1934	9	751	115	13.3	138	889
1935	10	794	162	16.8	114	908
1936	10	917	181	16.4	243	1,160
1937	12	1,102	242	18.0	202	1,304
1938	12	1,086	230	17.3	283	1,369
1939	14	1,110	249	18.3	1,021	2,131
1940	16	1,293	290	18.3	346	1,639
1941	17	1,751	372	17.5	353	2,104
1942	17	1,725	497	22.3	304	2,029
1943	18	2,309	410	15.1	382	2,691
1944	18	2,144	605	22.0	309	2,453
1945	18	2,339	634	21.3	584	2,923
1946	19	2,558	692	21.2	1,474	4,032
1947	19	2,633	905	25.6	960	3,593
1948	19	3,038	789	20.6	1,418	4,456
1949	20	3,656	1,515	29.5	1,480	5,136
1950	20	3,430	1,340	28.1	2,526	5,956
1951	21	3,198	735	18.7	1,939	5,137
1952	21	3,806	1,346	26.1	1,924	4,730
1953	21	3,854	1,220	24.0	1,899	5,753
1954	21	3,941	874	18.2	1,976	5,917
1955	21	3,474	447	11.1	1,936	5,410
Totals		54,932	13,550	19.9	23,654	78,586

In six instances a higher fee is exacted of those desiring certification without written examination. Examination and endorsement meetings are held in most instances semiannually or coincide with the examinations and meetings scheduled by the licensing boards.

In 1955 there were 3,921 examinations given by basic science boards; 3,474 were successful and 447 examination results were reported as unsuccessful. Unless permitted reexamination, the latter group does not qualify for consideration for licensure. The several basic science boards differ widely from each other in the restrictions

TABLE 39.—*Basic Science Fees*

Alaska	$25	Nevada	$25
Arizona	20	New Mexico	50 [4]
Arkansas	20 [1]	Oklahoma	15 [5]
Colorado	25	Oregon	10
Connecticut	10	Rhode Island	10
District of Columbia	25	South Dakota	15 [3]
Florida	10	Tennessee	25 [6]
Iowa	10	Texas	15 [3]
Michigan	10	Washington	10 [2]
Minnesota	15 [2]	Wisconsin	10 [3]
Nebraska	10 [3]		

1. Reciprocity, $28.
2. Reciprocity, $25.
3. Reciprocity, $15.
4. Reciprocity, $75.
5. Reciprocity, $50.
6. Reciprocity, $10.

put upon the candidate with respect to repetition of examinations that have been failed and the accumulation of credit. Because of these differences, the data in this section are presented in factual form as reported, and no attempt has been made to analyze the data on a comparable basis from state to state.

While the informative data presented may be useful to those seeking licensure in these states, it is recommended that the information be supplemented by direct communication with the basic science board. The present executive corresponding officer of each of the 21 basic science boards is as follows:

Arizona	Mr. Herbert D. Rhodes, University of Arizona, Tucson.
Arkansas	Mr. C. S. Dellinger, Zoology Department, University of Arkansas, Fayetteville.
Colorado	Dr. Esther B. Starks, 1450 Ogden St., Denver, 18.
Connecticut	Mr. M. G. Reynolds, 258 Bradley St., New Haven 10.
District of Columbia	Mr. Paul Foley, 1740 Massachusetts Ave., N.W.
Florida	Mr. M. W. Emmel, Box 340, Gainesville.
Iowa	Dr. Ben H. Peterson, Coe College, Cedar Rapids.
Michigan	Mrs. Anne Baker, 116 Stevens T. Mason Bldg., W. Michigan Ave., Lansing 15.
Minnesota	Dr. Raymond N. Bieter, 105 Millard Hall, University of Minnesota, Minneapolis.
Nebraska	Mr. Husted K. Watson, Room 1009 State Capitol Bldg., Lincoln 9.
Nevada	Dr. Donald G. Cooney, Box 9005, University Station, Reno.
New Mexico	Mrs. Marguerite Cantrell, Box 1522, Santa Fe.
Oklahoma	Dr. E. F. Lester, 813 Braniff Bldg., Oklahoma City.
Oregon	Dr. Earl M. Pallett, Secretary, State Board of Higher Education, Portland.
Rhode Island	Mr. Thomas B. Casey, 306 State Office Bldg., Providence.
South Dakota	Dr. Gregg M. Evans, 310 E. 15th St., Yankton.
Tennessee	Dr. O. W. Hyman, 874 Union Ave., Memphis.
Texas	Bro. Raphael Wilson, 407 Perry-Brooks Bldg., Austin.
Washington	Mr. Edward C. Dohm, Department of Licenses, Capitol Bldg., Olympia.
Wisconsin	Mr. William H. Barber, 621 Ransom St., Ripon.
Alaska	Dr. C. Earl Albrecht, Box 1931, Juneau.

NATIONAL BOARD OF MEDICAL EXAMINERS

The National Board of Medical Examiners, founded in 1915, includes in its membership representation from the Federation of State Medical Boards of the United States, the Council on Medical Education and Hospitals of the American Medical Association, the Association of American Medical Colleges, the Armed Services, and the Veterans Administration. Members at large are elected from among leaders in medicine throughout the United States. The purpose of this examining agency is to administer an examination that may be accepted as an adequate qualification for a medical license. The National Board is not a national licensing body. It is the function of the individual states to determine who shall practice within their borders and to maintain high standards of medical practice in accordance with their own rules and regulations.

The certificate of the National Board of Medical Examiners is accepted as an adequate qualification by the medical licensing authorities of the states, the District of Columbia, and the territories with the following exceptions: Arkansas, Florida, Georgia, Indiana, Louisiana, Michigan, North Carolina, Pennsylvania, and Texas. The New York Board of Medical Examiners allows only one grade below 70. Pennsylvania accepts certificates of the Board issued prior to Sept. 1, 1954, and the Michigan licensing board will accept certificates issued prior to Nov. 1, 1954, but requires a special written supplemental examination. Oral examinations are required by the licensing boards of Illinois, Rhode Island, and Wyoming.

Ten of the boards of examiners in the basic sciences accept the examinations of the National Board in lieu of their own. These include the boards of Alaska, Arkansas, Connecticut, Iowa, Michigan, Minnesota, Oklahoma, Tennessee, Wisconsin, and the District of Columbia. Diplomates of the National Board are required to take an examination in the basic sciences before obtaining a medical license in Arizona, Colorado, Florida, Nebraska, Nevada, New Mexico, Oregon, Rhode Island, South Dakota, Texas, and Washington.

The examination is divided into three separate parts and may be taken during the course of training in the medical school. Parts 1 and 2 are of the multiple-choice type. Each examination is developed by a separate committee appointed by the Board composed of teachers and clinicians in their own fields. All work pertaining to the development of the test is carried on in the offices of the National Board. The scoring procedure is administered for the Board by the Educational Testing Service of Princeton, N. J. The third, or final, part of the examination provides a total of seven hours for each candidate to demonstrate his ability to apply his knowledge of clinical problems in four major elements of general practice. In each of these subjects time is provided for the candidate to study a patient or clinical specimens. He is then required to write an essay test based upon the patient or the clinical specimens that he has studied. His essay paper is then reviewed by separate examiners in each subject. Following this, the examiners question the candidate in other aspects of the subject.

Examinations in part 1 are held in June and September and in part 2 in April and June. Part 3 of the examination is administered through subsidiary boards located in the major cities of the United States during the last two weeks of June of each year. Where indicated, interim part 3 examinations will be organized by an individual subsidiary board during the course of the year. The dates of all examinations are posted on medical school bulletin boards and published in THE JOURNAL and in "The National Board Examiner," the official publication of the National Board of Medical Examiners.

The National Board admits to its examinations any student in good standing in approved medical schools in the United States and Canada. The National Board does not, at the present time, admit to its examinations graduates of other medical schools. Upon receipt of a request initiated by a state licensing board, a specialty board, or a medical school, an individual trained in a foreign medical school may be admitted to the National Board examinations in order to satisfy special requirements or regulations of the licensing board, specialty board, or the medical school. He is not considered a candidate for a certificate but is admitted to the examination as a service to the agency requesting the service and the grades are sent only to the board or school concerned.

In the following paragraphs data are presented regarding the examinations conducted and the issuance of cer-

tificates by the National Board. This is the 34th annual compilation of these statistics. The board's first examination was given October, 1916. From that date and up to and including a test given in June, 1921, 11 examinations were given and 268 candidates were certified. Since 1922 the examination has been divided into three

TABLE 40.—*National Board Examinations in Part 1, 1922-1955*

Date	Total Examinations	Passed	Incomplete	Failed	% Failed
February, 1955	372	279	44	49	18.0
June, 1955	2,124	1,206	736	182	13.0
September, 1955	700	250	393	57	18.1
Totals	3,196	1,735	1,173	288	14.2
1922	388	263	58	67	20.3
1923	507	349	77	81	18.8
1924	591	415	69	107	20.5
1925	608	400	50	158	28.3
1926	625	436	104	85	16.3
1927	702	452	159	91	16.8
1928	843	533	231	79	12.9
1929	1,096	675	331	90	11.8
1930	1,260	801	345	114	12.5
1931	1,277	755	425	97	11.4
1932	1,307	847	371	89	9.5
1933	1,234	782	316	136	14.8
1934	1,241	809	347	85	9.5
1935	1,264	785	410	69	8.1
1936	1,344	858	363	123	12.5
1937	1,435	871	415	149	14.6
1938	1,654	986	508	160	14.0
1939	1,733	1,048	460	225	17.7
1940	1,653	1,069	375	209	16.4
1941	1,640	1,087	346	207	16.0
1942	1,867	1,204	471	192	13.8
1943	2,656	1,441	962	253	14.9
1944	4,229	2,326	1,465	438	15.9
1945	3,865	2,106	1,475	284	11.8
1946	3,148	1,695	1,189	264	13.5
1947	3,514	1,844	1,352	318	14.7
1948	3,807	2,178	1,262	367	14.4
1949	3,823	2,337	1,243	243	9.4
1950	3,678	2,358	986	334	9.0
1951	3,520	2,153	1,038	329	9.3
1952	3,989	2,467	1,147	375	9.4
1953	4,278	2,866	980	432	13.0
1954	3,252	2,286	677	289	11.2
1955	3,196	1,735	1,173	288	14.2
Totals	71,224	43,217	21,180	6,827	13.1

parts, which must be taken and completed in the following sequence: part 1, a written examination in six basic science subjects; part 2, a written examination in five major clinical divisions and their component subjects or subdivisions; and part 3, a clinical and practical evaluation of the candidate's ability in observation, in diagnostic acumen, and in the principles of therapy, applicable to four major elements of general practice, namely, clinical medicine, pediatrics, clinical surgery, and obstetrics and gynecology.

Tables 40 and 41 record the results of examinations given in parts 1 and 2 during 1954 and for each year since 1922. The data shown represent examinations conducted rather than persons examined. The tabular data include candidates who fail and are reexamined during the same year and those who pass parts 1 and 2 in the same year.

In 1954, 3,196 examinations were given in part 1; 1,735 passed, and 288, or 14.2%, failed. There were 1,173 incomplete examinations given. In part 2, 2,220 examinations were held; 2,181 passed, and 36, or 1.6%, failed. Incomplete examinations are seldom given in this part. There were three such examinations given in 1955.

Since 1922 a total of 71,224 examinations have been given in part 1 and 37,570 in part 2. During this period 43,217 passed part 1 and 35,962 passed part 2. In the 34-year period shown, there have been 6,827 failures in part 1 (13.1%), and 1,532 in part 2 (4.3%).

In 1955, 2,090 tests were given in part 3; 2,077 passed and 13 (0.6%) failed. Results of examinations in part 3 in 1955 and in the 33 preceding years are given in table 42. In 34 years, 32,568 were tested, of whom 31,755 were granted the certificate of the board. The percentage of failures in this final examination in 34 years was 2.5. The 2,090 physicians certified as diplomates in 1955 represented 66 medical schools in the United States, 6 in Canada, and 30 medical schools of other countries. The school and the number of examinees from each are included in table 43.

The data presented in the preceding tables represent examinations given. The number of persons tested during any one year is recorded for the 34-year period in table 44. The classification "Passed" or "Failed" in cases in which more than one examination has been taken in a given year are based on the results of the last examination during the year in question. Thus, if in 1955 a candidate passed part 1 but at a subsequent examination in 1955 he failed part 2, he is computed in this table as having failed. On this basis figures computed indicate that there were 6,968 persons who took at least one test of the National Board in 1955. In all, 126,975 persons were examined in one or more of the annual examinations, of whom 103,870 passed, 15,414 took incomplete examinations, and 7,691 (6.3%) failed.

TABLE 41.—*National Board Examinations in Part 2, 1922-1955*

Date	Total Examinations	Passed	Incomplete	Failed	% Failed
February, 1955	85	84	..	1	1.2
April, 1955	1,664	1,633	3	28	1.7
June, 1955	471	464	..	7	1.5
Totals	2,220	2,181	3	36	1.6
1922	109	90	0	19	17.4
1923	192	170	2	20	10.5
1924	267	227	0	40	15.0
1925	342	309	0	33	9.6
1926	381	334	1	46	12.1
1927	361	314	1	46	12.8
1928	410	371	1	38	9.3
1929	465	399	19	47	10.5
1930	620	543	7	70	11.4
1931	719	630	2	87	12.1
1932	732	674	0	58	7.9
1933	714	651	0	63	8.8
1934	633	583	0	50	7.9
1935	689	620	0	69	10.0
1936	708	716	2	50	6.5
1937	855	803	1	51	6.0
1938	861	815	0	46	5.3
1939	938	884	0	54	5.8
1940	1,028	963	9	56	5.5
1941	1,001	954	1	46	4.6
1942	1,072	1,031	0	41	3.8
1943	1,861	1,805	0	56	3.0
1944	1,405	1,350	0	55	3.9
1945	1,599	1,565	0	34	2.1
1946	1,825	1,782	0	43	2.4
1947	1,641	1,613	0	28	1.7
1948	1,742	1,725	0	17	0.9
1949	1,737	1,691	0	46	2.6
1950	1,863	1,837	0	26	1.3
1951	2,045	2,017	0	28	1.4
1952	2,017	2,001	0	16	0.8
1953	2,200	2,145	1	54	2.4
1954	2,258	2,169	26	63	2.8
1955	2,220	2,181	3	36	1.6
Totals	37,570	35,962	76	1,532	4.3

In 1955, there were 2,922 licenses to practice medicine issued by endorsement of the certificate of the National Board of Medical Examiners by 47 boards, the District of Columbia, Alaska, Canal Zone, Guam, Hawaii, and Puerto Rico. The number registered by each of these licensing boards is recorded in table 45. There have been 32,319 licenses issued on the basis of endorsement of the board's certificate by the various states, territories, and outlying possessions since 1915.

TABLE 42.—*National Board Examinations in Part 3, 1922-1955*

Year	Total Examinations	Passed	Failed	% Failed
1922	22	22	0	0.0
1923	82	81	1	1.2
1924	126	120	6	4.8
1925	219	206	13	5.9
1926	255	243	12	4.7
1927	293	272	21	7.2
1928	322	306	16	5.0
1929	352	337	15	4.3
1930	420	401	19	4.5
1931	437	419	18	4.1
1932	550	522	28	5.1
1933	551	526	25	4.5
1934	567	548	19	3.4
1935	598	578	20	3.3
1936	576	547	29	5.0
1937	668	630	38	5.7
1938	706	682	24	3.4
1939	770	729	41	5.3
1940	792	771	21	2.7
1941	910	885	25	2.7
1942	1,054	1,041	13	1.2
1943	1,230	1,213	17	1.4
1944	1,168	1,146	22	1.8
1945	1,245	1,232	13	1.0
1946	1,634	1,613	21	1.2
1947	1,741	1,723	18	1.0
1948	1,715	1,700	15	0.9
1949	1,685	1,674	11	0.6
1950	1,752	1,736	16	0.9
1951	1,738	1,708	30	1.7
1952	2,128	2,036	92	4.3
1953	2,039	1,979	60	2.9
1954	2,133	2,052	81	3.8
1955	2,090	2,077	13	0.6
Totals	32,568	31,755	813	2.5

TABLE 43—*Diplomates from Individual Medical Schools, 1955*

United States		Canada	
Medical College of Alabama	1	University of Manitoba	1
College of Medical Evangelists	33	University of Ottawa	1
Univ. of Southern California	4	University of Western Ontario	1
Stanford University	3	University of Toronto	3
University of California	3	McGill University	32
University of Colorado	2	University of Montreal	2
Yale University	65	Total	40
Georgetown University	95		
George Washington University	74		
Howard University	12		
Emory University	2		
Chicago Medical School	72	**Unapproved School**	
Northwestern University	38	Middlesex	1
Stritch School of Medicine	16	Total	1
University of Chicago	34		
University of Illinois	31		
Indiana University	2		
State University of Iowa	9	**Foreign**	
University of Kansas	1	Univ. of Sydney, Australia	1
University of Louisville	6	University of Vienna, Austria	1
Johns Hopkins University	5	Peiping Union Med. College, China	3
University of Maryland	10	Pennsylvania Med. School, China	9
Boston University	69	Woman's Christian Medical College, China	2
Harvard Medical School	16	National College of Medicine of Shanghai, China	2
Tufts College Medical School	108	West China Union Univ., China	2
University of Michigan	7	Tung Chi Med. College, China	1
Wayne University	2	University of Havana, Cuba	1
University of Minnesota	2	University of Charles, Czechoslovakia	2
St. Louis University	6	Univ. of Durham Med. School England	1
Washington University	17	Univ. of Liverpool, England	1
Creighton University	5	Univ. of London, England	3
University of Nebraska	6	Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	2
Albany Medical College	43	Government Med. School, Iran	1
State Univ. of N. Y., Brooklyn	133	American University of Beirut, Lebanon	2
University of Buffalo	69	Univ. of St. Joseph, Lebanon	1
Columbia University	111	Mukden Med. Coll., Manchuria	1
Cornell University	71	University of Amsterdam, Netherlands	1
New York Medical College	115	Univ. of Groningen, Neth.	1
New York University	134	Univ. of Leiden, Neth.	2
University of Rochester	57	Univ. of Utrecht, Neth.	1
State Univ. of N. Y., Syracuse	64	Univ. of Glasgow, Scotland	2
University of North Carolina	1	Licentiate of the Royal College of Physicians of Edinburgh, Royal College of Surgeons of Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow, Scotland	1
Duke University	22	Polish School of Med., Scotland	1
University of Cincinnati	3	Univ. of Basel, Switzerland	2
Western Reserve University	4	Univ. of Geneva, Switzerland	3
Ohio State University	11	Univ. of Lausanne, Switzerland	1
University of Oklahoma	1	Univ. of Zurich, Switzerland	1
University of Oregon	4	Chulakankarana University, Thailand	1
Hahnemann Medical College	49	Total	53
Jefferson Medical College	28		
Temple University	37		
University of Pennsylvania	39		
Woman's Medical College	17		
University of Pittsburgh	2		
Medical Coll. of South Carolina	1		
University of Tennessee	3		
Meharry Medical College	3		
Baylor University	1		
University of Utah	2		
University of Vermont	36		
University of Virginia	2		
Medical College of Virginia	8		
University of Washington	7		
Marquette University	13		
University of Puerto Rico	16		
Total	1,983		

A number of medical schools use National Board examinations for their own purposes. In some schools the entire second year class takes part 1 at the end of the second year; in others part 2 serves as a comprehensive examination at the end of the fourth year; in still other schools both parts 1 and 2 are taken by all students. At the present time there are 30 medical schools in which 25 or more students take National Board examinations. In 13 schools the National Board examinations are used for the entire class for either part 1 or part 2 or both parts 1 and 2.

TABLE 44—*Parts 1, 2, and 3, Excluding Duplications, 1922-1955*

Year	Total Examinations	Passed	Incomplete	Failed	% Failed
1922	525	381	58	86	18.4
1923	775	594	79	102	14.7
1924	978	756	69	153	16.8
1925	1,167	915	50	202	18.1
1926	1,161	930	105	126	11.9
1927	1,248	947	142	159	14.4
1928	1,430	1,101	211	118	9.7
1929	1,723	1,280	319	124	8.8
1930	2,044	1,547	322	175	10.2
1931	2,218	1,632	410	176	9.7
1932	2,342	1,850	355	137	6.9
1933	2,277	1,806	280	191	9.6
1934	2,261	1,801	330	130	6.7
1935	2,368	1,831	408	129	6.6
1936	2,517	1,989	353	175	8.1
1937	2,735	2,151	397	187	8.0
1938	2,992	2,308	493	191	7.6
1939	3,221	2,476	443	302	10.9
1940	3,188	2,597	363	228	8.1
1941	3,318	2,749	332	237	7.9
1942	3,607	3,014	391	202	6.3
1943	4,514	3,671	606	237	6.1
1944	5,363	4,235	759	369	8.0
1945	5,614	4,468	886	260	5.5
1946	5,912	4,730	898	284	5.7
1947	6,249	4,965	1,002	282	5.3
1948	6,389	5,194	902	293	5.3
1949	6,493	5,376	880	237	4.2
1950	6,596	5,630	665	301	4.5
1951	6,602	5,601	699	302	4.5
1952	7,334	6,204	729	401	5.5
1953	7,786	6,708	584	494	6.8
1954	7,060	6,222	472	366	5.5
1955	6,968	6,211	422	335	5.1
Totals	126,975	103,870	15,414	7,691	6.3

TABLE 45—*Licenses Granted on the Basis of National Board Certificates, 1955*

Alabama	12	New Mexico	1
Arizona	9	New York	861
California	403	North Carolina	2
Colorado	24	North Dakota	7
Connecticut	168	Ohio	112
Delaware	4	Oklahoma	10
District of Columbia	92	Oregon	25
Georgia	12	Pennsylvania	91
Idaho	8	Rhode Island	18
Illinois	100	South Carolina	16
Iowa	19	South Dakota	6
Kansas	12	Tennessee	19
Kentucky	12	Utah	10
Maine	30	Vermont	26
Maryland	96	Virginia	40
Massachusetts	273	Washington	38
Michigan	30	West Virginia	14
Minnesota	64	Wisconsin	19
Mississippi	4	Wyoming	3
Missouri	29	Alaska, Canal Zone, Guam, Hawaii, and Puerto Rico	35
Montana	8		
New Hampshire	25		
New Jersey	135		2,922

The officers of the board are Robert A. Moore, M.D., President; Herman G. Weiskotten, M.D., Vice-President; John P. Hubbard, M.D., Executive Secretary and Treasurer; J. Stewart Rodman, M.D., Honorary Medical Secretary; Christian J. Lambertsen, M.D., Assistant Secretary; George D. Ludwig, M.D., Assistant Secretary; and Everett S. Elwood, Consultant on State Board Relations.

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THE NEW A. M. A. DIRECTORY

The 19th edition of the American Medical Directory has been completed, and copies are now being shipped to subscribers. This edition, the first since 1950, was originally scheduled for publication in 1952 but had to be postponed because the change-over during that period to a dues-paying membership structure in the Association made it impossible to obtain an accurate list of members. Work began on the new edition late in 1954, with the sending of information cards to physicians, and it was only with the cooperation of the medical profession and allied organizations that it was possible to bring the Directory up-to-date and produce a book so large.

The new 3,122-page edition contains information on 240,638 physicians in the United States, its dependencies, and Canada, and also lists American graduates temporarily located in foreign countries. Since the 1950 Directory, more than 250,000 changes of address have been recorded in the files of the Directory Department, 46,348 names have been added, 24,225 have been deleted because of death, and an additional 1,172 have been deleted for other reasons.

The biographic data on physicians show, whenever available, the year of birth, medical school and year of graduation, year licensed in the state in which located, type of membership held in the A. M. A., other medical society affiliations, specialty practiced, certification by a specialty board, professorships, and residence and office addresses. This section contains a list of physicians whose addresses are unknown and a list of the physicians whose names were entered in the files of the Directory-Biographical Department after publication of the 18th edition in 1950 and who have since died.

To gain space so the Directory could include information on more physicians, it was necessary to make some editorial changes. The list of members of special societies, which formerly appeared in the front section of the Directory, was deleted, but symbols to indicate memberships in national medical organizations appear in the biographic data of physicians. A special committee of the Board of Trustees revised the criteria for the listing of membership in national medical organizations, and the societies whose members are eligible for listing in the physicians' data are given in the key to abbreviations and symbols, which is reprinted in several locations in the book.

The total number of physicians listed in the United States in the 1950 Directory was 201,277. In the 1956 edition, the number is 218,061, a gain of 16,784, or an average yearly gain for the past six years of 2,797. For Canada, the 1956 Directory lists 17,906 physicians, a gain of 3,310 over the 1950 total of 14,596, or an average yearly gain of 551. The Pacific States, as in 1950, show the largest increase in physicans for 1956, with a gain of 23% over the 1950 figures; the South Atlantic and Mountain States show gains of about 16%; and the Central, Middle Atlantic, and New England States show small gains. California leads in the number gained, with 20,763 physicians in 1956 as compared with 16,668 in 1950, a gain of 24.6%. Florida, showing a gain of 49.8%, now has 4,530 physicians as compared with 3,025 in 1950. Texas shows a gain of 1,026 physicians; Ohio, 990; Michigan, 963; and New York, 934. Among the smaller states showing a substantial increase in the number of physicians are Arizona, New Mexico, Oregon, and Utah. Slight losses in the number of physicians are indicated in Arkansas, Illinois, Iowa, Missouri, Vermont, and West Virginia.

In the Directory is a table showing the number of physicians by states, classified as to type of practice. These figures indicate that 30% of the physicians in the United States are in general practice; 31% limit their practice to a specialty; 10% give special attention to a specialty but do not limit their practice to it; 11% are serving internships or residencies, with an additional 6% in other full-time hospital services; 5% are retired or not in practice; 4% are not in private practice; and 3% are temporarily in military service or serving in various government agencies. Another table shows state distribution of specialists in the U. S., with a breakdown of those interested in a specialty, those limiting their practice, and those certified as specialists by examining boards in a medical specialty.

The compiling of information for the 19th edition of the American Medical Directory was possible only with the cooperation of the deans of medical schools; secretaries of medical licensing boards; hospital administrators; officers of constituent and component medical societies; special medical societies and the examining boards in specialties; alumni associations; state, county, and local health authorities; federal agencies; and thousands of physicians and correspondents who gave helpful assistance. All of this help was invaluable and is gratefully acknowledged.

The price of the Directory is $30 a copy, including postage within the United States. Orders can be placed by writing to Philip E. Mohr, Editor of the Directory, American Medical Association, 535 N. Dearborn St., Chicago 10.

THE FIFTY-FOURTH ANNUAL REPORT ON MEDICAL LICENSURE

The Council on Medical Education and Hospitals presents its annual compilation on medical licensure in this issue of THE JOURNAL. The report includes statistics concerning the medical examination and licensure of physicians in the United States and its territories and outlying possessions for the year 1955 as well as comparative figures for previous years. Also included is information pertaining to the current regulations for medical licensure. The officers of the examining boards and licensing agencies have been most cooperative in the submission of the current data and information essential in the compilation of a report of this nature, and for this asistance the Council is deeply grateful.

Analysis of the statistical data and textual information reveals that in 1955 a total of 14,840 licenses to practice medicine and surgery were issued by 53 boards authorized by law to grant licenses to practice the art and science of medicine. The 14,840 licenses issued last year represented 7,379 granted after a successful written examination and 7,461 granted by reciprocity and endorsement of state licenses or the certificate of the National Board of Medical Examiners. There was a decrease of 189 in the total number of licenses issued in 1955 as compared with the previous year. The number of licenses issued by examination increased 552, while the number of licenses issued by reciprocity and endorsement decreased by 741.

Licentiates of 1955 who received their first license to practice medicine and surgery during the calendar year and who represent additions to the medical profession numbered 7,737. In this group there were 907 foreign-trained physicians. In the same period there were approximately 4,000 deaths of physicians reported to the offices of the American Medical Association. Thus the physician population in the United States and its territories and outlying possessions was increased by about 3,800. Increases as compared with 1954 occurred in 15 states. Five states added more than 375 to their physician population; namely, California, Ohio, Pennsylvania, Illinois, and Texas.

Last year 1,101 examination failures were reported. The percentage of failures in the written examination of graduates from existing approved medical schools in the United States was 4.4%; of graduates of approved medical schools in Canada 3.7% failed; of the graduates of medical schools in the United States no longer in operation 50% failed; 75.4% of the graduates of unapproved medical schools at one time existing in the United States failed; the graduates of schools of osteopathy admitted to medical licensure examinations in several states had 15.3% failures; and 41.4% of the foreign-trained physicians examined for medical licensure last year failed. The total percentage of failures was 12.9%.

The report includes the preprofessional and professional educational requirements of each licensing board; the boards requiring an internship for licensure; regulations pertaining to the registration of interns and residents, licensure on the basis of government credentials, and licensure on the issuance of temporary and limited licenses; the schedule of written examination dates and reciprocity meetings; medical license fees; and annual registration requirements.

The licensure of foreign-trained physicians is specifically referred to in the first section of the report. Reference is made to the formation in 1954 of a Cooperating Committee on Graduates of Foreign Medical Schools, including representation from the Federation of State Medical Boards of the United States, the Council on Medical Education and Hospitals of the American Medical Association, the Association of American Medical Colleges, and the American Hospital Association. This committee has developed a proposal for an evaluation service for foreign medical graduates that has been approved in principle by the parent organizations represented on the committee. It is believed that the mechanism of this program will be developed within the next year.

The study reveals that graduates of 194 foreign medical schools and 5 licensing corporations were examined for medical licensure in 1955 by 39 boards. Graduates of the medical schools in the Philippines, Iceland, New Zealand, 14 South and Central American countries, 24 countries in Europe, and 13 countries in Asia were represented at examinations. There were 1,777 foreign-trained physicians examined, of whom 1,042 passed and 735, or 41.4%, failed. More than 50 graduates of the universities of Vienna, Havana, Munich, and Bologna were tested in 1955, and more than 20 graduates of 32 other schools were examined. In a 10-year period, the report points out, there were 6,865 foreign physicians registered, 5,442 after written examination and 1,423 by endorsement of credentials.

The second section of this report pertains to the results of examinations and endorsement of credentials sponsored by the 21 boards of examiners in the basic sciences. These boards have no licensing powers. A certificate of proficiency is issued that is a prerequisite to eligibility to practice. Such certificates were issued after written examination to 3,474 individuals, and by endorsement of credentials 1,936 certificates were issued. The failure percentage for those reporting this information was 19.9. A candidate in applying for a basic science certificate is not required by law to reveal his school of practice. The figures given, therefore, include graduates of all schools of the healing arts.

The final section of the report deals with the examinations given by the National Board of Medical Examiners. The examination of the National Board is given in three

parts; the first part may be taken after completion of the sophomore year in medical school, the second part on completion of the medical course, and the third part after a year of hospital service. The board's certificate is recognized by the medical licensing boards of the states, the District of Columbia, and the territories, with the exception of Arkansas, Florida, Georgia, Indiana, Louisiana, Michigan, North Carolina, Pennsylvania, and Texas. There were 6,968 persons who took at least one of the tests of the National Board in 1955, and 2,077 were certified as diplomates. In 1955, there were 2,922 licenses to practice medicine issued by endorsement of the certificate of the National Board by 52 licensing agencies. A number of medical schools also use National Board examinations for their own purposes. In some schools the entire second year class takes part 1, in others part 2 serves as a comprehensive examination at the end of the fourth year, while in other schools both part 1 and part 2 are taken by all students.

A GUIDE TO THE ESSENTIALS OF A MODERN MEDICAL PRACTICE ACT

In 1882 two states, acting independently so far as is now known, enacted state licensing laws regulating the qualifications and conduct of persons desiring to practice medicine. During the next quarter of a century the other states went their own but typically American way and enacted medical practice acts with little or no regard to the laws enacted in their neighboring states. Consequently, although the states had common objectives in dealing with common problems, there was great variation in the laws that were thus independently enacted. The result was that in 1909, only one year after the 48th medical practice act had been enacted, the House of Delegates of the A. M. A. realized that some degree of uniformity in the medical practice laws of the several states would be desirable and instructed its Committee on Medical Legislation to hold a conference of interested groups to discuss the preparation of a model medical practice act. Such a meeting was held in 1910, and the conclusion was reached that "much discussion and study will be necessary to secure agreement, even among the leading members of the profession." Apparently that conclusion was sound, because much discussion did take place—43 years' worth, in fact. Then, in 1953, the Federation of State Medical Boards appointed a committee headed by Dr. Bruce Underwood of Kentucky to present to the federation suggestions for certain basic essentials of medical practice acts that it was hoped might in principle be adopted more or less uniformly by all states. The committee went to work. With the cooperation of the staff of the headquarters' office, a thorough study of the medical practice acts of all the states was made, so that the various provisions relating to such things as definition, grounds for revocation, subjects of examination, revocation procedures, and reciprocity provisions could be compared on a state-by-state basis. An almost unbelievable diversity and variation in every phase of the acts was found—so much so, in fact, that in a preliminary report made to the federation in 1954 it was stated that one of the highlights of the study to date was an appreciation of the large measure of practical uniformity that had been achieved in the face of this diversity.

Last February, after three years of study and analysis, the committee presented, and the federation adopted, "A Guide to the Essentials of a Modern Medical Practice Act." This guide should be read thoroughly by all members of medical examining boards, all state medical society legislative committees, and all persons interested in problems of medical licensure. The committee has done a thought-provoking job and has presented its results in a form that is easy to read and comprehend. In the last analysis, of course, any medical practice act must be tailored to the needs of the state for which it is intended. Although this guide may not be perfect and may not contain all possible provisions that may be included in a medical licensing act, it will certainly constitute a valuable check list for evaluating any particular state law.

CHANGING CHARACTER OF MEDICAL MEETINGS

The character of medical meetings has changed markedly during the last half-century. At the meeting of the American Medical Association in Denver in 1898, the year before the Scientific Exhibit was initiated, there were 615 papers listed. These were read by "essayists," few of whom had co-authors, and they constituted the entire program.

At the coming meeting of the Association in Chicago in 1956, with the greatly increased attendance over the 1898 meeting, the number of "papers" has been reduced to 244, nearly half of which will have as authors two to five persons who have worked in collaboration. Other features of the meeting include more than 30 panels and symposiums on a variety of subjects, over 300 scientific exhibits covering all phases of medicine, four full days of color television, which brings the operating room directly into the meeting hall, and a spectacular group of motion pictures, many of which will be explained by their authors as the pictures are shown on the screen.

The spoken word is still necessary to convey information, but audiences apparently now prefer to be talked with, rather than talked at, and to look rather than merely to listen. Physicians who attend the Chicago meeting will find an abundance of medical material to "see" and numerous medical authorities available with whom to discuss their problems.

THE PRESIDENT'S PAGE

A MONTHLY MESSAGE

In a few weeks I will close my term as your president. This page has been the one medium through which I have been able to communicate personally with each member of the profession, although I have been fortunate to speak with many of you in my travels throughout the land. On this President's Page I have tried to tell you about the issues that have appeared to me to be most important.

Now I would like to tell you about the friendships that I have developed with the gentlemen of the press and their profession—friendships that you too can develop. First, let me say that never—to my knowledge—has anyone been more courteously treated by these gentlemen than I have. They have asked me some tough questions, but when I have answered some pointed question, they always have respected my request when I have declared "this is off the record." I also want to report that they have not misquoted me. And on two occasions when a rather startling headline was used they gave me ample opportunity to reply and to explain so that my own position was crystal clear.

On many occasions and in all sections of the country my speeches have been covered by reporters. In nearly every case the stories they wrote were accurate, objective, and interesting. In many cities I was interviewed by members of the press, and I made a sincere effort to explain A. M. A. policies and to give them some of my own ideas. The stories written from these interviews were of high quality, and I was proud of having worked with these men. My personal dealings with the press have strengthened my belief that Americans have an alert, responsible, and top-grade press.

Recently I received a letter from a young physician in one of our large cities. He asked me three pertinent questions. First, he wanted to know if it were ethical for a physician to be a member of the Junior Chamber of Commerce and to participate in its general activities. Of course, the answer is "It is perfectly ethical." The second question was: "Could a physician act as chairman of a community health promotional program of the Junior Chamber of Commerces." Again the answer is yes. The third dealt with my friends of the Fourth Estate. "Can various practicing physicians be used as speakers for various civic clubs, also for radio and television, and may their talks be reported in the local newspapers?" In the case of speeches before civic clubs, my answer again is an emphatic yes, provided the talks are not self-adulatory and as long as they are dignified and reasonable statements. As for tie-ins with radio, television, and newspapers, of course you accept, provided you have the consent or approval of your own county medical society.

When I was president of the Medical Society of the State of Pennsylvania, I made the statement in my inaugural address that the press was entitled to report and publish a human interest story about medical care and treatment and that the physicians and hospitals involved should be perfectly willing to give the facts to the press. Often, as you may have experienced, when the facts are known to the reporter, the story becomes a dud, and no newspaperman wishes to tell a dull or an untrue story.

The American Medical Association, through its public relations staff, always has cooperated with the press, radio, and television, and since I became President-Elect almost two years ago and then President last year, these fine men always have cooperated with me. I wish to thank them for their fairness and for their generosity to me as an individual and to you and your organization, the A. M. A.

Each of you should cooperate with your local press and radio and television stations, and when they call treat them properly and politely. They should have your help—the facts for a story or your opinions—when they need it. You should never ignore their requests or be too busy to talk with them. They are your friends, and, if you are frank and honest with them, they in turn will be the same with you. Let us all remember that the American press is the greatest educational unit that is available today. The medical profession has nothing to hide from the public. A well-informed press will reveal physicians in their true light as faithful servants to those individuals who suffer. We owe much to the American press. The medical profession cannot afford to be uncooperative, unfriendly, or antagonistic. The gentlemen of the press certainly have been my friends these last two difficult and important years of my life. I can only say, God save and keep independent the American press.

ELMER HESS, M.D., Erie, Pa.

ORGANIZATION SECTION

ACTIONS BY BOARD OF TRUSTEES

The following actions were taken by the Board of Trustees at its meeting in Washington, D. C., on April 8-9, 1956.

Council on Medical Physics

The Board voted to adopt a recommendation from its Committee on Scientific Councils that a Council on Medical Physics be established to carry on activities in the field of apparatus, instruments, and devices. This Council, which replaces the former Council on Physical Medicine and Rehabilitation, will be composed of 13 individuals selected from various fields of medicine, chosen because of the special knowledge that they have but not as representatives of specialties.

Committee on Rehabilitation

The establishment of an Intra-Association Committee on Rehabilitation was authorized, to be composed of one representative each from the Council on Medical Service, Council on Medical Education and Hospitals, Council on Mental Health, Council on Industrial Health, Council on Medical Physics, Council on Foods and Nutrition, and the Bureau of Health Education. The Committee will function as a study group and clearing house for rehabilitation matters and will submit recommendations to the Board of Trustees on its findings.

Committee on Scientific Councils

Dr. Stephen Rothman, Chairman of the Committee on Cosmetics, was appointed to membership on the Committee on Scientific Councils.

American Surgical Materials Association

The Board of Trustees approved sponsorship by the American Medical Association of the American Surgical Materials Association, in cooperation with the American Academy of Orthopaedic Surgeons, the American Hospital Association, and the American College of Surgeons. The primary function of the organization is the development and revision of standards for surgical materials and the evaluation of products that meet these standards. The American Surgical Materials Association would be organized as a so-called membership nonprofit corporation under the laws of Illinois and would have a 15-member board of directors, composed of representatives of the four sponsoring organizations and the three classes of membership: (1) professional and technical, (2) industrial, and (3) associate. The board of directors, in addition to being vested with the general administration of the organization, would authorize the adoption of standards and the acceptance of products. However, no member of the board who represented a manufacturer or fabricator would be permitted to vote on either of these matters.

Foreign Medical Graduates

The Board considered a detailed report of the Cooperating Committee on Graduates of Foreign Medical Schools, which included recommendations concerning procedures for evaluation of credentials and examinations for factual knowledge of these individuals and the incorporation of the Evaluation Service for Foreign Medical Graduates.

The Board voted to approve in principle the report of the Cooperating Committee and authorized the American Medical Association to become a parent member organization of the Evaluation Service for Foreign Medical Graduates.

Model Workmen's Compensation Act

The Board approved cooperation by the Council on Industrial Health with the United States Department of Labor, which is attempting to prepare a Model Workmen's Compensation Act.

Council on Medical Service

The recommendations of the Council on Medical Service that its elected membership be changed from six to nine and that consideration be given to the role of its ex officio members and to the present requirement that the immediate past-president serve on the Council were concurred in by the Board and referred to the House of Delegates.

American Assembly

A committee was appointed to confer with representatives from the American Assembly relative to the possibility of an assembly on the nation's health to be held in 1957.

Safety Charter

A Safety Charter for Children and Youth, prepared by nine organizations in the health and safety fields, was approved.

Annual and Clinical Meetings

Approval was given to a recommendation that the inaugural ceremony of the Annual Meeting be held in the Civic Opera Theatre in Chicago on Tuesday, June 12. The Board also authorized the holding of a civic luncheon at the Navy Pier in Chicago, to which leading individuals in industry, religion, and public affairs, as well as a representative group from the House of Delegates, would be invited.

Civil Defense

A resolution adopted by the Council on National Defense, at its meeting on April 8, was approved by the Board. The resolution recommended that the surgeon general of the United States Army permit instruction, on request, in the use of the Civil Defense 200-bed emer-

gency hospital and that this type of instructional activity be made a part of the training programs of reserve units and incorporated as a part of the Department of the Army medical training program for which annual unit training and armory drill pay is permitted.

Appointments

The following appointments were made:

Dr. B. Dixon Holland, to Committee on Occupational Health Services of the World Medical Association.

Dr. Joseph Sadusk Jr., to succeed Dr. Regan, and Mr. C. Joseph Stetler, as an additional member of the Committee on Medicolegal Problems.

Dr. Carlton Wertz, to succeed Dr. A. C. Scott Jr. on the special Committee on General Practice Prior to Specialization. Dr. George S. Klump was designated Chairman of this Committee.

Dr. Raymond Peterson of Butte, Mont., to fill the unexpired term of Dr. Rolland Whitacre on the Joint Commission on Accreditation of Hospitals.

Dr. Harold Muller, to succeed Dr. Harold Hitchcock on the Committee on Sports Injuries.

Dr. Louis H. Bauer, to represent the A. M. A. at the meeting of the National Medical Association, New York, Aug. 13-16, 1956.

Council on Industrial Health

Approval was given to the employment of Dr. B. Dixon Holland as Secretary of the Council on Industrial Health.

Printing Plant

Action was taken to discontinue the printing of THE JOURNAL and the specialty journals in the A. M. A. headquarters building, effective June 30, 1956. Editorial services for these periodicals, however, will continue to be carried out in the headquarters building. This action will make much needed space available for the expanded Association activities.

FEDERAL MEDICAL LEGISLATION

Medical Care Amendment to Public Assistance Law

Senator Martin (R., Pa.), in S.3139, and Congressmen Reed (R., N. Y.), in H.R.9091, and Cooper (D., Tenn.), in H.R. 9120, have proposed to amend the public assistance laws so that the federal government would make an earmarked contribution to medical care of recipients. Important to the medical profession is the provision of these bills that would authorize the Department of Health, Education, and Welfare to contribute one-half of the medical care costs paid to physicians and hospitals based on $6 per month per adult recipient and $3 per month per child recipient in each state. Since 1950, payments to vendors of medical care for services rendered to public assistance recipients have been authorized. Only about one-third of the states have taken advantage of this permissive program. Medical payments so made have been shared in equally by the states and the federal government but have been within an existing $55 maximum payment per recipient, in which the federal government participates. This new proposal would add additional federal dollars, earmarking them for use in medical vendor payments only. The Senate bill was referred to the Finance Committee and the House bills, to the Ways and Means Committee.

Prepared by the Washington Office of the American Medical Association.

Military Dependents Medical Care

Senators Jackson (D., Wash.) and Smith (R., Maine), in S.3154, propose establishing a medical care program for dependents of members of the uniformed forces through contracts with nonprofit voluntary health insurance plans in addition to care rendered in service facilities. This bill was introduced at the request of the American Hospital Association. The bill was considered during hearings on the House-passed bill, H.R.9429. All bills previously reported on this subject have been superseded by H.R.9429, which is expected to be voted on in the Senate shortly. The Senate bill was referred to the Committee on Armed Services.

Congressman Kilday (D., Texas), in H.R.9429, would provide for a uniform program of medical care for dependents of personnel in the uniformed services, including dependents of the armed services, Public Health Services, Coast Guard, and Coast and Geodetic Survey. Care would be rendered in any of the facilities of the services mentioned and through contracted-for private sources. Dependents could elect to receive their medical care from civilian facilities with the uniform services paying the cost, with the exception of the first $25 of care for any illness. Contracted-for service would be made available by the Secretary of Defense for all spouses and dependent children. It would be optional for him to contract for the service of other dependents, such as parents. It would also be optional for the Secretary of Defense to purchase services from private practitioners and private facilities for dependents of personnel overseas. A provision of the bill would permit the Secretary of Defense to limit free choice of care in civilian facilities in areas where military facilities are adequate. (The A. M. A. opposes this provision of the bill.) This bill passed the House of Representatives in March, and the Senate Armed Services Committee considered the bill in April.

CLINICAL MEETING IN SEATTLE, NOV. 27-30, 1956

The Clinical Meeting of the American Medical Association will be held in Seattle, Nov. 27-30, 1956, with a complete program of lectures, color television presentations, motion pictures, and scientific exhibits. Physicians wishing to participate in the lecture program should communicate with Dr. Hale Haven, 1309 Seventh Ave., Seattle 1. Application blanks for space in the Scientific Exhibit are now available and may be obtained from the Secretary, Council on Scientific Assembly, American Medical Association, 535 N. Dearborn St., Chicago 10.

MEDICAL NEWS

CALIFORNIA

Appoint Dean of Medical School.—Dr. J. B. deC. M. Saunders, chairman of the department of anatomy, University of California School of Medicine, San Francisco, since 1937, has been appointed dean of the school of medicine, with which he has been affiliated for 25 years. Dr. Saunders succeeded to the deanship vacated by the resignation in June, 1954, of Dr. Francis S. Smyth, who continued in the school of medicine as professor of pediatrics and director of the Indonesia project.

COLORADO

Pediatric Clinics in Denver.—A review of recent progress in pediatrics designed for general practitioners and specialists will be presented at the eighth annual Summer Clinics of the Children's Hospital in Denver, June 27-29. Presentations will emphasize patient evaluation, diagnostic methods of greatest value, and sound therapeutic advances. Guest speakers will be Dr. Harry Bakwin, professor of clinical pediatrics, New York University College of Medicine, New York City; Dr. Thomas C. Moore, associate in surgery, Indiana University Medical Center, Indianapolis; and Dr. Joseph C. Risser, associate professor of orthopedics, College of Medical Evangelists, Los Angeles. Information can be secured from the Chairman, Summer Clinics Committee, Children's Hospital, Denver 18.

ILLINOIS

Society News.—Mr. Edward A. Uzemack, Skokie, for the last three years executive assistant in the Public Relations Department of the American Medical Association, was named public relations director and assistant secretary of the Illinois State Medical Society, effective April 1. He previously was a reporter and rewrite man for the Chicago *Times* and Chicago *Sun-Times*.

Lectures on Psychiatry.—As the last lecture in its sixth annual series, "Psychiatric Problems in Medical Practice," the North Shore Health Resort, 225 Sheridan Rd., Winnetka, offers "The Utilization of Community Resources in Medical Practice" by Dr. Marc H. Hollender, chief psychiatrist, outpatient department, Neuropsychiatric Institute, University of Illinois College of Medicine, Chicago, June 6, 8 p. m., at the health resort. Physicians are cordially invited to attend.

Chicago

Monthly Cardiac Conference.—The monthly clinicopathological cardiac conference of Cook County Hospital will be held June 1, 11 a. m.-12 noon, in the Children's Amphitheater, 700 S. Wood St. "The Neurologic and Psychiatric Aspects of Patients who Undergo Cardiac Surgery" will be presented by the guest speaker, Dr. Walter S. Priest, associate professor of medicine, Northwestern University Medical School, and senior attending physician, Wesley Memorial Hospital. Everyone is invited.

Society News.—The German Medical Society of Chicago will meet May 28 at the Germania Club, 108 W. Germania Place (telephone MOhawk 4-0740). Dinner, 7 p. m., will precede the scientific meeting at 9 p. m. at which "Medical Education in Europe and the United States" will be reviewed by Dr. Percival Bailey, professor of neurology and neurosurgery, University of Illinois College of Medicine. The discussion will be opened by Dr. Dean F. Smiley, secretary of the Association of American Medical Colleges. Physicians are invited to attend the dinner and meeting.——The Chicago Society of Internal Medicine will hold its annual dinner at the Drake Hotel (SUperior 7-2200) May 28, 7:30 p. m. (cocktails 6:30 p. m.). "The Outlook on American Medicine from Washington" will be presented by Dr. Lowell T. Coggeshall.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

INDIANA

Microbiological Institute.—The department of biological sciences of Purdue University announces the ninth annual Microbiological Institute, June 4-9. The sessions will be devoted to lectures, laboratory exercises, and demonstrations to teach the characteristics of those fungi of greatest importance in industry. The evening lectures will include Importance of Fungi in the Paper and Fermentation Industries; Use of Antibiotics in Food Preservation; Imperfect Fungi of Industrial Importance; and Sex in Microorganisms. Information may be obtained from the Division of Adult Education, Engineering Administration Building, Purdue University, Lafayette, Ind.

MASSACHUSETTS

Dr. Suter Accepts Florida Appointment.—Dr. Emanuel Suter of the department of bacteriology and immunology at Harvard Medical School, Boston, has been appointed head of the department of microbiology in the University of Florida College of Medicine, Gainesville. Dr. Suter, whose appointment will become effective in June, served as a research fellow in the department of hygiene and bacteriology at his alma mater, the University of Basel in Switzerland, where he did research in chemotherapy of tuberculosis and toxoplasma. A Markle Scholar in Medical Science, Dr. Suter has taught a special course on representation of bacteriology and immunology given to graduate medical students at Harvard.

Harvard Alumni Day.—The Alumni Association of Harvard Medical School will present its alumni day symposiums, May 31, 10 a. m.-12 noon in Amphitheatre D of the medical school in Boston. After opening remarks by Dr. Alan Gregg, New York, vice-president, Rockefeller Foundation, the following program will be presented:

A. Baird Hastings, Ph.D., Boston, Hamilton Kuhn Professor of biological chemistry, Atoms in the Medical School.
A. Clifford Barger, associate professor of physiology, Some Observations on Experimental Chronic Congestive Heart Failure.
Richard Warren, associate clinical professor of surgery, The Surgeon Chisels at Old Age.
Paul D. White, Massachusetts General Hospital, subject to be announced.
John P. Merrill, associate in medicine, and Joseph E. Murray, instructor in surgery, Homotransplantation of the Kidney.

All alumni will be guests of the association at a buffet luncheon at the Quadrangle, 12:30 p. m. Preceding the luncheon the meeting will be addressed by Drs. John P. Hubbard, Philadelphia, president, class of 1931; George Packer Berry, dean, Harvard Medical School; and Nathan M. Pusey, Ph.D., president of the university.

MISSISSIPPI

Appoint Professor of Psychiatry.—Dr. Floy Jack Moore, assistant professor of psychiatry and psychology at Baylor University College of Medicine, Houston, Texas, has been named professor of psychiatry and chairman of the department of psychiatry at the University of Mississippi Medical Center in Jackson and will assume his new duties on June 1.

Personal.—Dr. Glace E. Bittenbender, professor and chairman of anesthesiology at the University of Mississippi School of Medicine, University, and director of anesthesiology for the university hospital, has been named to the board of governors of the American College of Anesthesiologists.——Dr. Daniel L. Hollis, Biloxi, high school physician for 23 years, was recently awarded a loving cup given by Biloxi Lions each year to the city's outstanding citizen. Dr. Hollis is a past-president and past-secretary of the Biloxi School Board, on which he served for 12 years. He has been a member of the New Biloxi Hospital board since 1936 and is currently its president.——The Mississippi State Medical Association recently honored Dr. Andrew M. Wynne, Merigold, by presenting him with a life membership, a certificate, and a gold pin after his 50 years of medical

practice.——Dr. James D. Hardy, chairman, department of surgery at the University of Mississippi Medical Center, Jackson, recently addressed the Mobile (Ala.) County Medical Society on "Some Tumors Off the Beaten Path: Diagnosis, Management, and Prognosis" and was the speaker for the March meeting of the South Mississippi Medical Society in Laurel, where he discussed "The Diagnosis and Management of Some Vascular Conditions Amenable to Surgery."

MONTANA

Society News.—The committee on rural health of the Montana Medical Association and the Montana Public Health Association will hold a joint meeting in Helena, June 5-6. Mr. Aubrey D. Gates, Field Director, Council on Rural Health, American Medical Association, will be a guest speaker. All Montana physicians are urged to attend.

NEW JERSEY

Hospital News.—The Atlantic City Hospital will have as visiting chiefs pro tem. Dr. Paul C. Colonna, professor of orthopedic surgery, University of Pennsylvania School of Medicine, Philadelphia, June 5-8; Dr. Richard A. Kern, professor of medicine, Temple University School of Medicine, Philadelphia, June 11-15; Dr. Francis M. Forster, professor and director of department of neurology, dean, Georgetown University School of Medicine, Washington, D. C., June 18-22; and Dr. Abraham Cantarow, professor of biochemistry, Jefferson Medical College of Philadelphia, June 25-29.

Personal.—Dr. Katharine H. Hain, Upper Montclair, formerly chief, bureau of heart disease, New Jersey State Department of Health, Trenton, has been appointed to the staff of medical writers of Schering Corporation, Bloomfield. Dr. Hain previously served five years as assistant pediatrician in the outpatient department of New York Hospital–Cornell Medical Center and was a fellow in pediatrics at that institution.——Dr. Harold N. Brewster, Montclair, medical secretary, Board of Missions of the Methodist Church, and a former medical missionary to China, has been granted a leave of absence and has been reinstated as a missionary so that he may go to northern Borneo to open medical work among the Ibans, a people who once were head-hunters. Dr. and Mrs. Brewster expect to leave for Sarawak in British North Borneo in September for a stay of at least two years.

NEW YORK

Medical Alumni Day.—Alumni Day at the State University of New York College of Medicine at New York City, Brooklyn, will take place June 2 in the college's new Basic Sciences Building, 450 Clarkson Ave. The program will include a panel on "Coronary Artery Disease," moderated by Dr. William Dock, professor of medicine, 10 a. m.-12 noon; a buffet luncheon in the college cafeteria, 12 noon-1:30 p. m.; the Alumni Memorial Convocation, 2-2:45 p. m.; and a tour of the Basic Sciences Building, 3-4 p. m. Proceeds of the annual alumni dinner at the Roosevelt Hotel in New York City will go to the Alumni Association's Research, Scholarship, and Student Loan fund.

New York City

Award to Dr. Papanicolaou.—The Passano Foundation announces that Dr. George N. Papanicolaou, professor emeritus of clinical anatomy, Cornell University Medical College, New York, has been selected as the recipient of the $5,000 Passano Foundation award for 1956, which will be made during the A. M. A. Annual Meeting in Chicago at a reception to be held in his honor, June 13, at the Palmer House. Dr. F. Bayard Carter, chairman, department of obstetrics and gynecology, Duke University School of Medicine, Durham, N. C., will evaluate Dr. Papanicolaou's contribution, and Dr. Dwight H. Murray, Napa, Calif., President-Elect of the American Medical Association, will discuss the value to clinical medicine of the type of research the Passano Foundation honors each year. The award to Dr. Papanicolaou is being made for his researches in exfoliative cytology. The Passano Foundation, formed late in 1943 to encourage medical science and research, is sustained by annual contributions from the Williams & Wilkins Company, publishers.

OHIO

State Medical Election.—Newly elected officers of the Ohio State Medical Association include Dr. Richard L. Meiling, Columbus, president; Dr. Robert S. Martin, Zanesville, president-elect; and Dr. George J. Hamwi, Columbus, treasurer.

Meeting on Industrial Health.—The B. F. Goodrich Company, Akron, will hold its first industrial health conference at the Research Center, Brecksville, June 14-15. After greetings by Frank K. Schoenfeld, Ph.D., vice-president, research, and welcoming remarks by Dr. Rex H. Wilson, medical director, Mr. J. N. Hart, director, employee relations, will speak on "Industrial Health and Employee Relations" and Mr. D. D. Reichow, director, union relations, on "Industrial Health and Union Relations." The program also includes "Medical Department Records" and "Physical Examinations" by Dr. Wilson, "The Application of Medical Restrictions" by Dr. Harold E. Reed, medical division, and "Medical Procedures in Compensation Cases" by Dr. G. H. Donnelly, medical division. There will be a dinner at the Akron City Club Thursday, 6:30 p. m.

OKLAHOMA

Society News.—Dr. Ralph A. McGill, Tulsa, has been named chairman of a special planning committee for the celebration of the Tulsa County Medical Society's 50th anniversary in 1957. Other members of Dr. McGill's committee are Drs. Franklin J. Nelson and John G. Matt, Tulsa. The woman's auxiliary will observe its 25th anniversary in 1957.——Dr. Edgar A. Hines Jr., head of a section in medicine at the Mayo Clinic, Rochester, Minn., will be guest speaker for the Tulsa Academy of General Practice May 28 at the Hotel Tulsa. His subject will be "Examination of the Patient for Peripheral Vascular Disease." Dinner at 6:30 p. m. will precede the scientific program, 8 p. m. Dinner reservations may be made by telephoning LUther 2-5904. All physicians are invited to attend both the dinner and the program. Dr. Hines, co-author of a textbook entitled "Peripheral Vascular Diseases," published in a second edition in 1955, is on the editorial board of *Circulation*.

OREGON

Society News.—The Southern Oregon Medical Society will meet in Klamath Falls, June 1. The guest lecturers will be (1) Dr. Charley J. Smyth, assistant professor of medicine, University of Colorado School of Medicine, Denver, who will have as his subjects "Rheumatoid Arthritis—Treatment in the Cortisone Era" and "Gout—Treatment of an Ancient Illness," and (2) Dr. Walter G. J. Putschar, Charleston (W. Va.) General Hospital, whose topics will be "Skin Tumors with Emphasis on the Clinical Findings" and "Pathology of the Gallbladder."

TENNESSEE

Society News.—The Tennessee Radiological Society recently elected the following officers: Dr. Ben R. Mayes, Nashville, president; Dr. Walter E. Scribner, Kingsport, vice-president; and Dr. George K. Henshall, Chattanooga, secretary-treasurer.

State Medical Election.—Newly elected officers of the Tennessee State Medical Association include Dr. Robert B. Wood, Knoxville, president; Dr. J. Paul Baird, Dyersburg, president-elect; and Drs. John C. Thornton Jr., Brownsville, Rae B. Gibson, Greeneville, and Kenneth L. Haile, Cookeville, vice-presidents. Mr. Jack E. Ballentine, Nashville, remains as executive secretary.

University News.—The University of Tennessee College of Medicine, Memphis, has appointed Drs. Elmer W. Sydnor Jr. and Stephen A. Pridgen as assistants in the department of surgery and Drs. John L. Hobson and Earle U. Scharff as assistants in the division of internal medicine. Promoted from instructor to assistant professor were Dr. Robert F. Ackerman, division of preventive medicine, and Dr. C. D. Hawkes, department of surgery. Advanced from assistant to instructor in the department of dermatology were Drs. F. Fox Miller and John W. Baird.

VIRGINIA

Personal.—Dr. Walter B. Martin, Norfolk, past-president of the American Medical Association, will be given the honorary degree of doctor of science at commencement exercises of the Medical College of Virginia, Richmond, May 29.

Anderson Lectureship.—The University of Virginia School of Medicine, Charlottesville, announces that Dr. John F. Anderson, who received his medical degree from the university in 1895, has made a gift to the university to establish a lectureship in medical science or public health. The lectureship will be known as the John F. Anderson Memorial Lectures in Medicine. Dr. Anderson, who has made many contributions to medicine, is now living in retirement at 195 College Ave., New Brunswick, N. J. In 1903 Dr. Anderson described Rocky Mountain spotted fever and suggested the wood tick as the probable vector. He followed this with papers on the relationship between spotted fever, Brill's disease, and "tabardillo," the typhus fever of Mexico. In 1901 he became affiliated with the U. S. Public Health Hygienic Laboratory and in 1909 became its director. In 1915 he resigned from this post to become director of the Research and Biological Laboratories of E. R. Squibb & Sons. A former chairman of the Section on Pharmacology and Therapeutics, Dr. Anderson was elected a member of the A. M. A. Council on Pharmacy and Chemistry in 1914.

WEST VIRGINIA

Anniversary of Public Health.—The observance of "75 Years of Public Health in West Virginia" will highlight the 32nd annual State Health Conference at the Daniel Boone Hotel, Charleston, June 7-8, held in cooperation with the West Virginia Public Health Association. The commemorative ceremonies will be presented under the auspices of the state department of health. Dr. Newman H. Dyer, Charleston, state director of health, will deliver the historical address Thursday morning. An address will be given at the banquet that evening by Dr. Thomas L. Harris, Parkersburg, former member of the public health council.

Health Education Workshop.—The fifth annual Health Education Workshop, sponsored by the state department of health, will be held at the Daniel Boone Hotel, Charleston, June 6. The program, which has as its theme "The Citizen Talks Back," will open at 9 a. m. with an address of welcome by Dr. Newman H. Dyer, Charleston, state director of health. The address by Mrs. John F. McCuskey, Clarksburg, past-president of the woman's auxiliary to the West Virginia State Medical Association, will be followed by group discussions. The afternoon will include a panel, group discussions, and reports from the discussion groups. Topics to be discussed will include community health problems, programs for laymen and for public health workers, and the necessity for health education.

Personal.—Dr. Stephen Mamick, White Sulphur Springs, who has been chief of radiology at the Veterans Administration Hospital, Roanoke, Va., has been named chief of the department of radiology at the Williamson Memorial Hospital, Williamson, where he will also be in charge of the laboratory.——Dr. Lyle J. Roberts, Martinsburg, who has been health officer for district no. 6 (Berkeley, Jefferson, and Morgan counties) for five years, has resigned and will return to his home town, Omaha. Dr. Roberts, a veteran of both world wars, retired with the rank of rear admiral. He was taken captive by the Japanese in Manila on Jan. 2, 1942, and was freed 43 months later.——Dr. Paul L. McCuskey, Parkersburg, has been named by Dr. Athey R. Lutz, Parkersburg, president of the West Virginia State Medical Association, as the official representative of the association on the West Virginia Council on Education. The council on education, which has previously been limited to representatives of education and closely related agencies and organizations, is now being enlarged to include representation from major business, labor, industrial, professional, civic, and other lay organizations. ——Dr. William R. Laird, president of Laird Foundation, Montgomery, will receive the honorary degree of doctor of literature at commencement exercises of the Medical College of Virginia, Richmond, May 29.

GENERAL

Award Competition for Medical Students.—The 11th annual Schering award competition is open to medical students in the United States and Canada, who are invited to submit papers on (1) clinical use of adrenocortical steroids in collagen diseases; (2) metabolic aspects of the aging process; or (3) new applications for antihistamines in medicine and surgery. Prizes of $500 and $250 are offered for each of the three subjects. Students interested in participating, either individually or in teams, should submit their entry forms before July 1. Manuscripts must be postmarked not later than Sept. 30, 1956.

Louis Livingston Seaman Fund.—The New York Academy of Medicine announces the availability of the Louis Livingston Seaman fund ($1,000) for the furtherance of research in bacteriology and sanitary science. The fund was made possible by the terms of the will of the late Dr. Louis Livingston Seaman. Expenditures may be made for: (a) securing of technical help; (b) aid in publishing original work; or (c) purchase of necessary books or apparatus. Application from institutions or individuals should be sent before July 1 to Dr. Wilson G. Smillie, Chairman of the Louis Livingston Seaman Fund, 105 E. 22nd St., New York 10.

Research in Blood Diseases.—The Hematology Research Foundation invites applications for the Ruth Berger Reader Fellowship for research in blood diseases in the academic year 1956-1957. The stipend for the fellowship is $3,000 a year, with option to renew. The offer is to workers of any race, creed, or color in the United States. The foundation also invites applications for one-year grants-in-aid for hematologic research. Nine copies of the application must be submitted no later than June 15, 1956, to Hematology Research Foundation, 64 W. Randolph St., Chicago 1. Awards will be announced by the Medical Advisory Council the latter part of June. The council will choose the applicants on the basis of merit and will also choose the institution in Chicago in which the work is to be done.

Symposium on Cosmetics in Medical Practice.—A symposium on the significance of cosmetics in medical practice, sponsored by the Committee on Cosmetics of the American Medical Association, will be held June 13 at 3 p. m. in the ballroom of the Knickerbocker Hotel, Chicago. Dr. Raymond R. Suskind, Cincinnati, will serve as moderator for the following presentations before the Section on Dermatology at the 105th annual meeting of the Association:

Cutaneous Effects of Soaps and Detergents, Raymond R. Suskind, Cincinnati.

Rational Use of Cosmetics in Medical Practice: (1) The Emollient Creams and Their Modern Additives, Irvin H. Blank, Ph.D., Boston; (2) Sunscreens and Solar Hypersensitivity: Masking Cosmetics, Protective Creams, Stephen Rothman, Chicago; and (3) Depilatories and Antiperspirants, Herbert Mescon, Boston.

Clinical Appraisal of Dermatoses Due to Cosmetic Materials, Carl T. Nelson, New York.

Discussion by all participants will follow.

Meetings of Pathologists.—The Northeastern Region of the College of American Pathologists, the New England Society of Pathologists, and the New York State Society of Pathologists will hold a joint meeting June 1 and 2 at the Lake Placid Club, Lake Placid, N. Y. Speakers by invitation will include Dr. George Lumb, reader in pathology, Westminster Medical School, London University, London, England, whose topic will be "Rectal Biopsies in Ulcerative Colitis," and Dr. Lenore Simpson, Roswell Park Memorial Institute, Buffalo, who will discuss "Thyroid Tumors Following Therapeutic Irradiation."——A joint meeting of the Middle Eastern Region of the College of American Pathologists, the Washington Society of Pathologists, the Maryland Society of Pathologists, and the pathology section, Baltimore City Medical Society, is scheduled for May 26 in the Auditorium, Veterans Administration Hospital, Baltimore. At 5 p. m. a seminar on lymph nodes will be conducted by Dr. R. Philip Custer, director of laboratories, Presbyterian Hospital, Philadelphia.

Pediatricians Meet in Sun Valley.—The Intermountain Pediatric Society will hold its annual meeting in Sun Valley, Idaho, June 7-9. Round-table discussion at noon by the visiting speakers

will follow each program. The afternoons will be left free for informal discussion and for recreation. On Thursday Dr. Edith L. Potter, Chicago, will discuss "Pathology of Prematurity"; Dr. Douglas N. Buchanan, Chicago, "Degenerative Neurological Diseases of Childhood"; and Dr. Horace L. Hodes, New York, "The Encephalitides." On Friday "The Brain, the Liver, and the Spleen" will be presented by Dr. Buchanan; "Diagnostic Problem Cases" by Dr. Amos Christie, Nashville, Tenn.; and "Management of Gram-Negative Bacillary Infections" by Dr. William L. Hewitt, Los Angeles. Saturday's program will consist of "Chemotherapy of Resistant Infections" by Dr. Hewitt; "Newer Methods of Diagnosis of Virus Diseases" by Dr. Hodes; "Cytomegalic Inclusion Bodies" by Dr. Potter; and "The Differential Diagnosis of Nontubercular Chest Diseases" by Dr. Christie. For information, write the Intermountain Pediatric Society, 2000 S. 1300 E., Salt Lake City.

Endocrinologists Meet in Chicago.—The 38th annual meeting of the Endocrine Society will be held in the Palmer House, Chicago, June 7-9, under the presidency of Warren O. Nelson, Ph.D., New York. Invited papers will include:

Experimental Hypertensive Vascular Disease in Rats Bearing Regenerating Adrenal Cortical Tissue: Morphologic and Pathogenetic Studies, Floyd R. Skelton, Augusta, Ga.

Steroid Dehydrogenases as Models for the Binding of Hormonally Active Steroids, Paul Talalay, Chicago.

Metabolic Principles of the Anterior Pituitary, Maurice S. Raben, Boston.

The presidential address will be delivered at the annual dinner Friday, 7:30 p. m., which will be preceded by cocktails, 6:30 p. m. At a clinical session, 2 p. m., Saturday, a symposium on adrenal function, especially as related to Cushing's syndrome, will be presented by Dr. Claude J. Migeon, Johns Hopkins Hospital, Baltimore, who will discuss "Assay of Urinary and Blood Steroids and Responses to ACTH," and by Dr. Randall G. Sprague, Mayo Clinic, Rochester, Minn., who will consider "Clinical Manifestations of Cushing's Syndrome, Its Diagnosis and Therapy." "Diagnosis and Treatment of Diabetes Insipidus" will be the topic of Dr. William C. Thomas Jr. (by invitation), Johns Hopkins Hospital, Baltimore, and "Current Laboratory Methods Used in Evaluation of Thyroid Function with Special Emphasis on Errors in Their Interpretation" that of Drs. F. Raymond Keating Jr., Rochester, Minn., and Sidney C. Werner, New York.

Eastern Division Surgical Meeting.—The United States and Canadian sections of the International College of Surgeons will hold an eastern division regional meeting in the Sheraton-Brock Hotel, Niagara Falls, Canada, June 1-2. The program will include:

Surgery of Anorectal and Pelvirectal Abscess or Fistula, Harold Courtney, Syracuse, N. Y.

Low Back Pain: Causes and Treatment, Palmer O. Eicher, Indianapolis.

Safeguarding the Laryngeal Nerve in Goiter Surgery, Max M. Simon, Poughkeepsie, N. Y.

Management of Tic Douloureux, Wallace B. Hamby, Buffalo.

Role of Radium Therapy in Treatment of Breast Carcinoma, Walter T. Murphy, Buffalo.

Use of Hypothermia in General Surgery, Richard W. Egan, Buffalo.

Chemotherapy of Suppurative Disorders of the Lung, Including Tuberculosis, Edwin J. Grace, Brooklyn, N. Y.

Blood Derivatives and Plasma Substitutes, Ross T. McIntire, Chicago.

Treatment of Carcinoma of the Breast, Demid L. C. Bingham, Kingston, Canada.

Five Hundred Gastric Resections, Lyon H. Appleby, Vancouver, Canada.

Surgical Relief of Pain, Fraser B. Hamilton, Hamilton, Canada.

Pilonidal Sinus: A Method of Treatment, Albert K. Mighton, Hamilton, Canada.

Diagnosis of Renal Disease, James F. Brunton, Hamilton, Canada.

A banquet in honor of Dr. Horace E. Ayers, professor of gynecology at the New York Medical College, Flower and Fifth Avenue Hospitals, and vice-president of the United States section, will be given Friday evening. Dr. William C. Gillick of Niagara Falls, N. Y., is general chairman of the meeting, and Dr. Archie T. Eaton of Hamilton, Canada, general chairman of the Canadian section.

CANADA

Meeting on Physical Medicine.—The Canadian Association of Physical Medicine and Rehabilitation will hold its fourth annual meeting in the auditorium of the University of Western Ontario Medical School, London, Ontario, June 1-2. The scientific session will open at 10:30 a. m. Friday with "Psychosocial Study of the Upper Extremity Amputees" by Dr. Gustave Gingras and V. Susset, Montreal. Immediately before luncheon Dr. Lewis Cohen, Detroit, will discuss "Plethysmography in the Rehabilitation of Patients with Peripheral Arterial Disorders." The guest speaker at the banquet in the Hotel London Friday evening will be Stanwood L. Hanson, assistant vice-president, Liberty Mutual Insurance Company, Boston.

CORRECTION

Tuberculous Meningitis.—In the foreign letter from the United Kingdom on tuberculous meningitis (THE JOURNAL, April 7, pages 1254 and 1255), the impression is given that Dr. Lorber does not give drugs intrathecally for tuberculous meningitis. He does not give isoniazid in this way but routinely gives a minimum of 25 intrathecal injections of streptomycin.

EXAMINATIONS AND LICENSURE

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various locations in the United States and Canada, July 20. Final date for filing application was Jan. 20. Sec., Dr. C. B. Hickcox, 80 Seymour St., Hartford 15, Conn.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY. *Written.* Various centers, July 26. *Oral.* St. Louis, Oct. 12-15. Final date for filing applications was April 1. Sec., Dr. B. M. Kesten, One Haven Ave., New York 32.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Oct. 15, 1956. Final date for filing application is May 1. *Oral Examinations in 1956.* Chicago, June 7-9. Final date for filing application for these three oral examinations was Jan. 3. New York City, Sept. 21-25. Final date for filing application was April 1. *Cardiovascular Disease.* Chicago, June 6. The number of candidates is limited to 24 and the final date for filing applications was Apr. 2. Exec. Sec., Dr. William A. Werrell, 1 West Main St., Madison 3, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Part I.* 1957. Applications now being accepted. Final date for filing applications is Oct. 1. Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6.

AMERICAN BOARD OF OPHTHALMOLOGY: *Practical Examination.* San Francisco, June 18-21, St. Louis, Oct. 20-24. *Written.* Jan. 21, 1957. Applications must be filed before July 1, 1956. Sec., Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland 9, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Oral. Part II.* Chicago, January 1957. Final date for filing application is Aug. 15. Sec., Dr. Sam W. Banks, 116 South Michigan Ave., Chicago 3.

AMERICAN BOARD OF PATHOLOGY: *Written and Practical.* Chicago, Oct. 4-6. Final date for filing application is Sept. 1. Sec., Dr. Edward B. Smith, 1040-1232 W. Michigan St., Indianapolis 7.

AMERICAN BOARD OF PEDIATRICS: *Oral, Part II.* Cincinnati, June 8-10; New York City, Oct. 12-14, and San Francisco, Dec. 7-9. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION. *Parts I and II.* Chicago, June 16-17. Sec., Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Oral and Written.* New York, Dec. 10-11 and New Orleans, Mar. 18-19. Sec., Dr. David A. Boyd, Jr., 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: Chicago, June 5-9. Final date for filing applications was Jan. 1.; Los Angeles, Sept. 30-Oct. 4. Final date for filing applications is June 1. Sec., Dr. B. R. Kirklin, Kahler Hotel Bldg., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Part II.* Boston, May 14-15 and Philadelphia, June 4-5. Sec., Dr. John B. Flick, 255 S. Fifteenth St., Philadelphia.

AMERICAN BOARD OF UROLOGY: February 1957. Sec., Dr. William Niles Wishard, 1711 N. Capitol Ave., Indianapolis 7.

BOARD OF THORACIC SURGERY. *Written.* Various centers throughout the country, September. Final date for filing application is July 1. Sec., Dr. William M. Tuttle, 1151 Taylor Ave., Detroit 2.

DEATHS

Abrahamson, Emanuel M. ⊕ New York City; Columbia University College of Physicians and Surgeons, New York City, 1926; certified by the National Board of Medical Examiners; specialist certified by the American Board of Internal Medicine; served during World War II; on the staff of the Jewish Hospital in Brooklyn; died March 19, aged 58.

Amos, Willie Joseph, Detroit; Meharry Medical College, Nashville, Tenn., 1914; died in the Veterans Administration Hospital, Dearborn, Feb. 18, aged 65, of pneumonia and carcinoma of the floor of the mouth with metastases to lymph nodes, lung, and left adrenal gland.

Arbogast, Hoye John, Rock Springs, Wyo.; University of Nebraska College of Medicine, Omaha, 1905; fellow of the American College of Surgeons; on the staff of Memorial Hospital of Sweetwater County; died March 24, aged 75, of cerebral hemorrhage.

Bernstein, Frederic K., Glen Cove, N. Y.; Long Island College Hospital, Brooklyn, 1915; member of the Medical Society of the State of New York; associated with the Manhasset (N. Y.) Medical Center Hospital and the Huntington (N. Y.) Hospital; died Jan. 3, aged 65.

Cate, Clarence Clifton ⊕ Morgan, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1905; past-president and secretary of the Bosque County Medical Society; for many years city and county health officer; served as a member of the school board; at one time mayor; on the staff of the Hillcrest Hospital in Waco; died Jan. 22, aged 73, of coronary occlusion.

Coombs, Forrest Pembrock, Wellsburg, W. Va.; University of Cincinnati College of Medicine, 1919; served during World War I; died in the Ohio Valley General Hospital, Wheeling, March 14, aged 69, of coronary occlusion.

Cosby, Lewis Franklin, Abingdon, Va.; Medical College of Virginia, Richmond, 1912; on the staff of the Johnston Memorial Hospital; died Feb. 28, aged 74, of pneumonia.

Crebs, Berry Stewart, Stonefort, Ill.; Bellevue Hospital Medical College, New York City, 1891; died in the Carmi (Ill.) Township Hospital Jan. 6, aged 89, of uremia.

Dunford, Joseph C. ⊕ Portsmouth, Va.; Medical College of Virginia, Richmond, 1909; served during World War I; formerly member of the city council; died March 22, aged 70, of hypoplastic anemia.

Ewing, Fayette Clay, Pineville, La.; Jefferson Medical College of Philadelphia, 1884; an associate member of the American Medical Association; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; died April 15, aged 93, of chronic pyelonephritis.

Fitzgerald, David Henry ⊕ Northfield, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; practiced in Chicago, where he was on the staff of St. Joseph's Hospital; died in Evanston (Ill.) Hospital Feb. 29, aged 74, of coronary disease.

Gould, Ned Burke ⊕ Modesto, Calif.; Cooper Medical College, San Francisco, 1908; fellow of the American College of Surgeons; died March 3, aged 75, of a ruptured aorta.

Greven, Harry John, Proctorsville, Vt.; Baltimore Medical College, 1907; health officer for the town of Cavendish; died in Ludlow March 9, aged 70, of coronary disease.

Harman, Clarence, Emerson, Iowa; Starling Medical College, Columbus, 1898; served in France during World War I; affiliated with Murphy Memorial Hospital in Red Oak and the Mercy Hospital in Council Bluffs; at one time connected with the hospital staff of the Iowa Ordnance Plant in Burlington, and on the staff of the Glenwood (Iowa) State School; died in Omaha, Neb., March 10, aged 80, of uremia and arteriosclerosis.

⊕ Indicates Member of the American Medical Association.

Hay, James Cecil, Ellensburg, Wash.; McGill University Faculty of Medicine, Montreal, Canada, 1923; fellow of the International College of Surgeons; died March 19, aged 56.

Jenkins, Mathew K. ⊕ Atlanta, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1891; died in the Georgia Baptist Hospital Feb. 6, aged 86, of arteriosclerotic heart disease and cirrhosis of the liver.

Johnston, Edgar Harvey, Alexandria, Ohio; Ohio Medical University, Columbus, 1901; past-president of the Licking County Medical Society; medical examiner for the Licking County Draft Board during World War II; served during World War I; vice-president of the Alexandria Library Board; president of the Alexandria Bank; on the staff of the Newark (Ohio) Hospital; died Feb. 9, aged 80, of massive myocardial infarction.

Limquico, Jose D., Philadelphia; Jefferson Medical College of Philadelphia, 1918; served during World War II; died in the Northeastern Hospital Jan. 24, aged 62, of pneumococcic meningitis and pneumococcic pneumonia with septicemia.

McCreight, Marlin Samuel ⊕ Oskaloosa, Kan.; Rush Medical College, Chicago, 1894; also a graduate in pharmacy; died in St. Francis Hospital, Topeka, Feb. 10, aged 85, of complications due to a hip fracture.

Marks, Hippolyte Peter, Jr. ⊕ New Orleans; Tulane University School of Medicine, New Orleans, 1936; served during World War II; died Feb. 16, aged 43, of coronary thrombosis.

Marston, Warren Winfield, Falmouth, Mass.; Tufts College Medical School, Boston, 1910; member of the Massachusetts Medical Society; died in Taunton Jan. 4, aged 69, of bronchopneumonia, cardiac dilatation, and fracture of the left femur.

Maxwell, John Alfonsus, Bridgeport, Conn.; Medical College of Virginia, Richmond, 1917; member of the Connecticut State Medical Society; associated with St. Vincent's Hospital; died in Trumbull Feb. 22, aged 68, of a heart attack following an automobile accident.

Menees, Thomas William, Nashville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1897; served overseas during World War I; died Feb. 13, aged 77.

Offerman, Edith Marie ⊕ Pemberville, Ohio; Ohio State University College of Medicine, Columbus, 1921; retired staff member of the Columbus State Hospital; died Feb. 17, aged 74.

Peirson, Edward Lawrence ⊕ Salem, Mass.; Harvard Medical School, Boston, 1925; specialist certified by the American Board of Urology; certified by the National Board of Medical Examiners; member of the American Urological Association; fellow of the American College of Surgeons; chief of urological service at the Lynn Hospital and the Salem Hospital, where he was president of the staff; died March 8, aged 57.

Pettit, Harry Howard ⊕ Ridgewood, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1905; an honorary member of the medical staff of the Valley Hospital; for many years health officer of the village; served as a director of the Citizens First National Bank and Trust Company; died Feb. 29, aged 73, of cerebral thrombosis.

Rubin, Sigmund Ulysses ⊕ Brooklyn, N. Y.; New York Homeopathic Medical College and Flower Hospital, New York City, 1926; associate surgeon at Cumberland Hospital; on the staff of Crown Heights Hospital, where he died Jan. 19, aged 55, of coronary thrombosis.

Sheets, R. Philip ⊕ Traverse City, Mich.; University of Arkansas School of Medicine, Little Rock, 1917; specialist certified by the American Board of Psychiatry and Neurology; member of the American Psychiatric Association; served in France during World War I; formerly on the staff of the Pontiac (Mich.) State Hospital; served as superintendent of the Traverse City State Hospital; died March 8, aged 63, of cerebral hemorrhage.

FOREIGN LETTERS

ARGENTINA

Epidemic of Poliomyelitis.—Between Jan. 1 and March 12, 1,310 cases of poliomyelitis with 120 deaths were reported in Buenos Aires; 80% of the patients were under 4 years of age. Because not enough pulmotors were available, Uruguay sent 20 accompanied by trained technicians and the United States sent many more by air. At one time, more than 120 pulmotors were in use. The National Foundation for Infantile Paralysis of the United States also sent consultants to aid in the prevention and treatment of the disease. All the stock of gamma globulin available in the United States was sent to Argentina and is being injected in children under 6 years of age. The usual seasonal decline in April was expected. The total number of paralytic cases in this epidemic was expected to reach 3,000. Tentative plans for mass inoculation with the Salk vaccine are being considered.

FRANCE

Hemobilia.—Caroi and co-workers in *Revue medico-chirurgicale des maladies du foie* (no. 1, pages 27-63, 1956) stated that hemobilia (hemorrhage in the biliary ducts) is a rare disease that occurs after a traumatic injury or an operation on the biliary ducts. There is a latent period of from a few days to nine months. The disease is characterized by recurring gastrointestinal hemorrhages, icterus, and contracture or tumefaction of the right side of the abdomen. The central rupture of the liver following trauma gives way to an autolysis that may even result in atrophy of one hepatic lobe with a compensatory hypertrophy of the other. Infection with Escherichia coli and Pseudomonas aeruginosa may occur. Polyvalent antibiotic treatment is indicated.

BCG Vaccination.—Since 1953, BCG vaccination of infants has been compulsory, but only 181,553 have been vaccinated instead of 900,000. This discrepancy is attributed to the fact that some physicians and teachers are not convinced of the efficacy of BCG vaccination. Some adenitis without any serious complications was noticed in about one of every 2,000 infants vaccinated. R. Mand stresses the fact that, although the vaccination gives no protection in the weeks immediately following vaccination, neither does it make the persons vaccinated more susceptible to infection; it increases neither the risk nor the severity of the primary infection.

INDIA

Effect of Anticoagulants on the Sedimentation Rate.—Bhatia and Agarwal in the *Indian Practitioner* (February, 1956) stated that some patients recovering from coronary disease showed unusually high sedimentation rates that were thought to be due to the administration of anticoagulants. Hence the effects of heparin, bishydroxycoumarin, ethyl biscoumacetate, and phenindione on the sedimentation rate were studied in patients having a normal sedimentation rate. Heparin was seen to have an accelerating effect on the sedimentation rate. The appearance of this effect is delayed for some unknown reason. A corresponding rise in plasma fibrin was observed but could not be explained. During administration of bishydroxycoumarin, the sedimentation rate may be greatly increased, in which case it no longer serves as an index of the progress of the disease. Ethyl biscoumacetate did not affect the sedimentation rate. With phenindione there was a progressive fall in the sedimentation rate and the prothrombin concentration. Both returned to the original level when the drug was discontinued. Thus, it was noticed that some anticoagulants have marked accelerating or retarding effect on the normal sedimentation rate, which may mislead the physician with regard to the diagnosis and prognosis in patients with coronary disease.

Surgical Treatment of Leukoderma.—V. P. Mehta in *Antiseptic* (March, 1956) reported the treatment of 58 patients with intractable leukoderma by intradermal impregnation of pigments. The results were satisfactory and no complications were observed. The conditions of these patients had proved refractory to such medical treatment as the application of irritant oils, ultraviolet or other rays, and methoxsalen. Clinically there were no symptoms other than the cosmetic disfigurement. The procedure is carried out under strict aseptic conditions. An exact shade matching the normal color of the skin is prepared by mixing various colors. These pigments are insoluble and stable to heat and light. They are impregnated into the skin with the help of an electric drill or a dermajector. Repeated sittings are required to get a perfect result. The advantages of surgical treatment are certainty of result, short duration as compared to the medical treatment, and proper control of the shade of the vitiliginous area.

Leprosy.—Dharmendra and Sen in the *Bulletin of Calcutta School of Tropical Medicine* (January, 1956) state that results with isoniazid alone in the treatment of leprosy were not very satisfactory. After an initial improvement there is usually a setback, possibly due to the development of drug-resistant strains of Mycobacterium leprae. They therefore tried the drug in combination with diaminodiphenylsulfone on the assumption that sulfones may delay the development of resistant strains. Twenty-four patients with the lepromatous type of leprosy were treated by this combination. Both drugs were given orally six days a week. Improvement was progressive, and the degree of improvement was proportional to the duration of treatment. No setback or deterioration was observed when the combined treatment was used.

Adrenal Cortical Function in Diabetes.—In the *Indian Journal of Medical Research* (January, 1956), Bahl and his co-workers reported the findings in an investigation of adrenal cortical function in untreated patients with diabetes mellitus with or without ketosis. Of 44 patients between 15 and 66 years of age, 10 had ketosis. All had glycosuria and their glucose tolerance curves were determined before treatment was started. It was found that in diabetics without ketosis 50% of the 25 men and 40% of the 19 women showed a decreased excretion of 17-ketosteroids. Some diabetics showed a fall in serum sodium levels and a rise in serum potassium values. Some of the diabetics with ketosis exhibited hyperactivity of the adrenal cortex as shown by an increased excretion of urinary 17-ketosteroids.

JAPAN

Tuberculosis.—Dr. Chiba reports that less than 20 years ago 60% of the patients he examined had pulmonary tuberculosis, many of them with cavities. Early diagnosis and modern drugs are rapidly improving this situation. Faith healers, however, still exploit the unenlightened masses. In most hospitals and sanatoriums the old traditions prevail and the patient brings with him his own bedding and cooking utensils and is accompanied by a relative who assists in nursing him and in preparing his diet.

Socialized Medicine.—A national health and accident insurance plan was inaugurated 32 years ago with an enrollment of 12 million workers. The success of the program is attested by the fact that the number of participants is now 30 million. The insured pays 2% of his earnings, matched by a like sum from his employer. Deficits, met by government subsidy, have been rapidly increasing. This is due in large part to the use of more costly medicines, particularly antibiotics. Many physicians supplement

The items in these letters are contributed by regular correspondents in the various foreign countries.

their low incomes by doing their own dispensing and have so far resisted efforts by the government to require that all prescriptions be filled by a pharmacist.

PERU

Symposium on Sinusitis.—The 10th Peruvian Congress of Medicine in March in Lima included a symposium on ethmomaxillary sinusitis. Dr. Toribio Ponce said that good aeration and drainage are essential to the successful prophylaxis and management of the condition. Conservative therapy is preferred, operation being indicated only for patients in whom adequate medical therapy fails. The Caldwell-Luc and Ermiro de Lima operations are the most suitable for the treatment of simple chronic maxillary sinusitis and ethmomaxillary sinusitis. By resorting to these procedures when indicated, the speaker obtained a cure rate of 87% in those affected with the former and of 75% in those affected with the latter. No deaths or complications were observed in 304 operations. Most patients when first seen had had symptoms for more than two years, and for this reason the Ermiro de Lima operation was performed 197 times on 147 patients, 75% of whom were cured. Of the 73 patients who underwent the Caldwell-Luc operation, 58 were cured. Teaching the patient to maintain good nasal aeration, judicious use of antibiotics, and adequate control of allergic processes will reduce the need for radical operations.

Poliomyelitis.—Poliomyelitis is increasing in frequency in Peru according to Drs. P. Angulo and H. Zambrano, of the Home-Clinic of San Juan de Dios of Lima, in a report to the 10th Peruvian Congress of Surgery. Although poliomyelitis is relatively uncommon as compared to other infectious diseases, the sudden outbreaks of epidemics and the lack of specific treatment make prophylactic campaigns desirable. The home-clinic is devoted exclusively to children with physically disabling diseases, and nearly 30% of its inmates are victims of poliomyelitis.

Arnold's Neuralgia.—A series of 47 patients with neuralgia of the auricular branch of the vagus was reported by Dr. F. Alayza Escardó to the 10th Peruvian Congress of Surgery. The condition is characterized by suboccipital pain that shifts to the vertex or, less frequently, to the shoulder. It is usually paroxysmal and stabbing or burning in nature. During remissions tenderness and such paresthesias as tightness, oppression, and formications are present. Cough, friction from clothing, changes of the ambient temperature, and other minor physical stimuli are capable of inducing the painful paroxysms. Because of the varied anastomoses of the auricular branch of the vagus, the condition may stimulate cervicofacial neuralgia and even atypical trigeminal neuralgia, but a pathognomonic sign is the acute pain elicited by pressure over the nerve as it emerges from the temporal bone. Usually emotional tension, restlessness, neurovegetative dystonias, and mild stiffness of the muscles of the nucha are associated with the condition.

The cause was known in 78% of the speaker's series, head injuries accounting for 28% of the total. If the disease is caused by organic processes involving the bone or vertebral ligaments, it is accompanied by limitation of motion of the neck, crepitation, and constant pain that is aggravated by moving the head and is relieved by rest and immobility. Medullary tumors are heralded by a suboccipital neuralgia. Cervical disk syndrome usually arises in lower segments of the cervical chain. On the other hand, neuralgias persisting after meningitis are not rare and may cause intracranial hypertension. Arnold's neuralgia must also be differentiated from myalgic headache or the indurative cephalalgia that follows muscular contraction of the nucha. Every patient suspected of having Arnold's neuralgia should be given a thorough physical examination, and a careful history of the pain must be obtained. Determination of the cause of the condition is important because in many cases the cause can be removed, but, in any case, immediate symptomatic relief of the pain is mandatory in order to prevent psychosomatic manifestations.

Identification of the Newborn Infant.—The Peruvian Congress has created an Office of Identification of the Newborn. This office will insure that in every hospital, maternity clinic, and similar institution an impression of the soles of the feet of the newborn infant are obtained immediately after birth. The mother's fingerprints and, if possible, those of the father are also obtained and later an impression of the palms and thumb of the infant. All of this data will be obtained in triplicate to provide a copy for the physician, the hospital, and the Office of Identification. In order to register the child's birth one of these records must be produced.

Estrogens and Mammary Function.—Dr. Villar Martinez in *Revista peruana de obstetricia* (vol. 3, no. 1, 1955) states that he gave ethinyl estradiol to 27 women who had weaned their babies and to 3 others who were still nursing their babies. In all of the women the flow of milk dried up completely 5 to 13 days after starting therapy. The smallest total dose needed to suppress mammary function was 1.2 mg. and the largest was 1.9 mg. There were no untoward effects, except in one patient who observed uterine bleeding two days after withdrawal of the hormone. The estrogen probably acts directly on the hypophysis by inhibiting the production of prolactin or luteotropin.

UNITED KINGDOM

Antigenicity of Poliomyelitis Vaccine.—Last year pilot quantities of poliomyelitis vaccine were prepared in the United Kingdom. In May, however, it was decided that the vaccine should not be used, as it contained the Mahoney strain of type 1 poliomyelitis virus. Before this decision was made, a small batch of the vaccine had been tried out in 15 human volunteers. The findings in this small group of adults have now been reported by D. Tyrrell and his co-workers (*Brit. M. J.* **1**:598, 1956). The methods used in the preparation of the vaccine were similar to those outlined in the Minimum Requirements for Poliomyelitis Vaccine issued by the National Institutes of Health, U. S. Public Health Service. Types 1, 2, and 3 viruses were represented by strains Mahoney, MEF-1, and Saukett respectively. Mice, in two groups of 40, were each given three injections of 0.5 ml. intraperitoneally at weekly intervals. The response was only moderate, the maximum serum antibody titer produced being 1:32. The results of the challenge test in mice were more impressive: 45% survival in the group that received undiluted vaccine, 10% in the group that received vaccine diluted 1:5, and 5% in the nonimmunized group. Four normal rhesus monkeys were each given three injections of 1 ml. of vaccine intramuscularly, the second injection being given one week after the first, and the third four weeks after the second. Serum removed two weeks after the third injection showed great variation in serum antibody titers—from 1:4 to 1:256. Antibody against each virus component of the vaccine, however, was detected in all four animals.

The 15 human volunteers were also given the vaccine intramuscularly. Serum for testing was obtained before vaccination, one week after the first injection, and two weeks after the third injection. Every subject showed a significant rise in antibody titer to at least one component of the vaccine. All six subjects in whom type 1 antibody was not demonstrated initially and all seven subjects in whom type 2 antibody was not demonstrated initially developed such antibodies after inoculation: in the case of the former, the titers ranged from 1:4 to 1:128 and, in the latter, from 1:8 to 1:256. On the other hand, of the seven subjects with no type 3 antibody initially, five had not developed it one week after the first injection and it was still absent in two after the third injection. All subjects who possessed antibody for a particular virus type in the initial specimen showed a rapid and marked rise in titer after the first injection of vaccine, except those in whom the initial titer was at the upper limit of the range of the test and in whom, therefore, no further rise could be detected. The two major conclusions reached were that this vaccine is an effective antigen for adults, though there is some evidence that the type 3 component is not as potent as the types 1 and 2 components, and that, as a guide to the probable performance of a batch of vaccine in man, the monkey is a satisfactory laboratory animal. Little is yet known, however, of how children under 5 years of age react to the vaccine.

CORRESPONDENCE

REINOCULATIONS OF POLIOMYELITIS VACCINE

To the Editor:—I have had a number of inquiries concerning the question of reinoculations in children who received poliomyelitis vaccine during the 1954 field trial. I intend to discuss this subject, in relation to the broader problem of degree and duration of vaccine effectiveness, at the Annual Meeting of the American Medical Association in Chicago in June. However, the date of publication of that report will be too late to provide guidance for physicians before the 1956 season. Therefore, I thought it might be helpful to outline certain thoughts that bear on this question. It will be recalled that Dr. Francis found vaccination, as performed in the field trial, and using the particular preparations then available, to be effective in 60% or more of those exposed to a potentially paralytic infection. We might reason, therefore, that there remain, in the group of field trial children, approximately 40% or less who did not develop an immune response. We now know the reasons for the high proportion of failures, and we know that it is possible to avoid this in present and future application of vaccination.

Since the three inoculations for the field trial were given close together (one week between the first and second, and four weeks between the second and third inoculations), another injection was offered, in the spring of 1955, to children who, in the spring of 1954, received field trial vaccine. In the 60% who developed an immune response, the dose given in the spring of 1955 could be considered as "the booster." However, in the 40% who failed to respond in 1954, the single dose received in the spring of 1955 can be considered merely as "the first dose of a primary inoculation series." Such children would benefit from another dose in the spring of 1956. This would then correspond to the second dose that is now being given to many of the children who received their first dose in 1955. Because of the high proportion of failures in the field trial groups, these children should receive another injection, before the 1957 poliomyelitis season, as the equivalent of a third injection, which should be administered anytime beyond seven months after the normal second dose. Children who were in the 1954 field trial and received two inoculations in the spring of 1955 should be given the equivalent of the third, or booster, dose prior to the 1956 or 1957 poliomyelitis season, the time depending upon the availability of vaccine in relation to the needs of those who have not yet received any vaccine. Children who were in the 1954 field trial and have had no subsequent inoculations should be treated as if they have not yet been vaccinated and should be given two doses, four to six weeks apart, with the third dose before the 1957 season. We have encountered no harmful effects in treating some 7,000 children with additional inoculations of vaccine, as here described. I wish to emphasize that the foregoing recommendations are based on the fact that 40% or less of children who received vaccine for the field trial failed to respond insofar as protection and antibody can be measured. Although at least 60% do not need further inoculations at this time, they cannot be distinguished, except by blood test, from the approximately 40% who did not respond.

The opinions about reinoculations in the case of field trial children should not be construed as referring to those instances in which the first dose of commercially available vaccine was given in the spring of 1955 or later. It has already been demonstrated that the one dose given in 1955 was effective in 60% or more (average 75-80%). It can be expected that by the time three doses have been given a higher proportion than 60% will have responded. It might be well to repeat that there is no loss of effect of each preceding dose; it appears that absence of immunity is due to failure to respond initially or subsequently. There is no need to begin a vaccination series over again if more than six weeks have elapsed between the first and second doses, nor if more than seven months have elapsed between the second and third doses. In fact, all indications are that longer intervals provide some additional advantage, but the four to six weeks, and the seven-month minimal interval, are satisfactory for practical purposes. There are many instances in which vaccine was given in 1955-1956 with use of the 1954 field trial schedule, i. e., one week between the first and second dose and four weeks between the second and third dose. In those instances the second dose cannot be considered to be as effective as if it had been given at two to six weeks (preferably, four to six weeks). Such children should be considered as having had but two effective doses and should receive another dose, seven months or longer after the last dose, as the equivalent of the long-interval booster that is recommended. This need not be done until before the 1957 poliomyelitis season.

On the basis of the reasoning set forth, it appears that for some of the children who were in the field trial there might exist an unjustified sense of security if consideration is given merely to the number of inoculations administered and not to the possibility that some received vaccine that was, in terms of our present knowledge, less than optimal. It would seem proper that those who made a contribution, as did these volunteers, should, as early as possible, be given full advantage of the information derived from the studies in which they participated. From the scientific viewpoint, there is another consideration. Should field trial children who failed to respond in 1954 subsequently be exposed and become paralyzed, the impression might develop that the effect of vaccination is of short duration; in actual fact what might be occurring is delayed exposure of children who were among the 40% who did not respond initially; such children might have been paralyzed in 1954 if they had been exposed at that time. Both for the reason of providing the field trial children with the fullest advantage of knowledge gained from and since the field trial and because of the danger of erroneous conclusions concerning persistence of immunity that could be deduced from improperly interpreted observations, it would seem to me that the parents of children who were in the 1954 field trial should be made aware of the considerations and needs outlined above.

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TWO DEATHS IN LONG-DISTANCE RUNNERS

To the Editor:—It has been suggested to me that a report of the main findings in my investigation of two deaths of runners after 5-mile and 6-mile races be sent to THE JOURNAL in order that it be placed in the appropriate literature. The complete report appeared in the *Amateur Athlete*, June, 1955. On Nov. 26, 1953, in Manchester, Conn., a 20-year-old cross country runner collapsed shortly before the finish of a 5-mile road race. He was found to have hemiplegia of the right side. He died approximately 48 hours later. Autopsy revealed occlusion of the left internal carotid artery. On June 18, 1954, in St. Louis, a 29-year-old runner collapsed after finishing a 6-mile race on the track. Nine days later he died. Autopsy revealed diffuse liver damage. There was a question as to whether the changes were due to heat stroke or hepatitis. From my personal knowledge of this runner I concluded that he might have had a slight heat stroke, but the main cause of death must have been hepatitis. Neither of the tragedies could have been averted by the routine physical examinations before the races, which were relatively short. These casualties are the only two I have heard of in 20 years of studying long-distance running.

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MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Sarcoidosis (Boeck's Sarcoid) in Lungs and Mediastinum: A Clinical Survey of 220 Patients. L. Heilmeyer, K. Wurm and H. Reindell. München. med. Wchnschr. **98:**145-151 (Feb. 3) 1956 (In German) [Munich, Germany].

The clinical picture of the pulmonary form of sarcoidosis (Boeck's sarcoid) is not widely recognized, although it is not rare. A total of 220 patients with sarcoidosis was studied at the Medical University Clinic of Freiburg in Germany. Since an exact definition of sarcoidosis is still impossible, the authors briefly outline the histological, immunologic, and clinical aspects. A new feature in this study is the classification of pulmonary sarcoidosis into three stages, based on roentgenologic and clinical observations. The first stage is that of bihilar adenopathy, which ends in cure with complete restoration of normal conditions or in cicatricial hilar induration. The second stage may appear (1) in a reticular form (primary lymphogenic dissemination); (2) a miliary form (primary hematogenous dissemination); (3) a small-spotted form of infiltration; or (4) a coarse nodular form of infiltration. The first two of these four forms may be cured either by complete restoration or increased reticulation, or they may progress to the third and fourth forms, with pulmonary hypertension, respiratory insufficiency, and eventually death. The third or end stage of the pulmonary form of sarcoidosis is characterized either by the formation of large conglomerations with fatal termination or by fibrosis, which represents a sclerotic cicatrization.

If the stage of pulmonary sarcoidosis is recognized, therapy and prognosis is possible. Cortisone has proved of therapeutic value, particularly during the second stage. Its use is unnecessary during the first stage, and while it usually cannot effect cure in the third stage, it may produce symptomatic improvement. Another surprising discovery was that some patients showed considerable or even complete disappearance of the pulmonary lesions during pregnancy, but the lesions usually recurred after the pregnancy. As regards the pathogenesis of sarcoidosis, the authors present evidence to the effect that it is due to a histiocytic hyperergasia, which in turn may be elicited by various causes, but in Germany the tubercle bacillus and its metabolites are chiefly responsible.

Clinical Aspects and Therapy of Sarcoidosis. O. Buschmann. Beitr. Klin. Tuberk. **115:**203-210 (No. 3) 1956 (In German) [Berlin, Germany].

Of 75 patients with sarcoidosis, 31 were observed at the medical clinic of the City Hospital in Bremen, Germany, between 1947 and 1954. The sarcoidosis in the others was detected at several hospitals and outpatient departments for tuberculous patients and at a dermatological and eye clinic. Among the various organs involved, the lung with hilar and parenchymal lesions accounted for the largest majority (93.3%) of sarcoidosis lesions. The pulmonary lesions were classified according to the stages suggested by Heilmeyer. Sixty-three of the patients have been observed for periods up to 14 years. In more than half of these patients (55.5%) spontaneous remissions occurred, and in 14.2% the sarcoidosis was progressive. In evaluating therapeutic results, the frequency of spontaneous cures should be taken into account. The author comments on the dangers and undesirable side-effects of cortisone therapy. Because of these it should not be used indiscriminately. In certain extrapulmonary forms of sarcoidosis, as in lesions of the eye and of the nervous system, treatment with cortisone is advisable, but in pulmonary sarcoidosis its use should be largely restricted to the second stage. Patients with the first stage of pulmonary sarcoidosis usually have no complaints and have a high rate of spontaneous recovery (68% in the cases reviewed by the author). In the third stage cortisone is unlikely to effect improvement; on the contrary, it is likely to intensify the fibrosis and should therefore be rejected.

SURGERY

Bilateral Pheochromocytoma. J.-T. Michaud. Laval méd. **21:** 155-164 (Feb.) 1956 (In French) [Quebec, Canada].

A case of bilateral pheochromocytoma is reported in a man admitted to hospital after an automobile accident. His initial blood pressure was 250/140 mm. Hg. This fell progressively to 180/120, at which time the patient's condition was improved. However, 10 hours after admission he was in a cold sweat, with a pressure of 110/70 mm. Hg. An exploratory laparotomy was performed because of pain in the hypochondrium and the right iliac fossa. He was thought to have traumatic rupture of the liver. An opening through the posterior peritoneum revealed a large quantity of blood, particularly around the right kidney, which was compressed superiorly by a hemorrhagic, oozing mass the size of a grapefruit. Exploration of the left kidney revealed a similar mass. It was then decided that the patient had bilateral pheochromocytoma, but in view of his precarious condition and the lack of preoperative preparation, only evacuation of the hematoma was carried out, with lateral draining of the perirenal region. The patient survived the first few days after operation, norepinephrine being administered when his blood pressure fell. He appeared to be on his way to recovery when, on the eighth postoperative day, he became hyperthermic, appeared intoxicated, and, despite the fact that his arterial pressure was not elevated compared with its former values, he became unconscious and died with a temperature of 107 F (41.7 C). The diagnosis was confirmed at autopsy, which also revealed the existence of a purulent infection of the lungs. It is felt that this was the cause of death. The author points out that, of the 16 patients with pheochromocytoma reported on in the literature in whom operation was performed without specific preparation, all but one died in irreversible shock within 48 hours of the procedure. The present patient was able to withstand the trauma, even though his disease was bilateral. His unfortunate case may focus attention on his children, with resultant earlier diagnosis and treatment for them, if they should prove to have pheochromocytoma. The disease definitely has a hereditary element.

Incarcerated Inguinal Hernia in Infants and Children—a Preventable Condition. G. W. Holcomb Jr. J. Tennessee M. A. **49:**37-40 (Feb.) 1956 [Nashville, Tenn.].

Infantile inguinal hernias occur because of failure of the embryonic processus vaginalis to become obliterated and not because of a weakness of the surrounding tissues, as is often the case with adult hernias. An inguinal mass that appears when a child cries or stands and disappears when he lies down is almost certain evidence of an inguinal hernia. The diagnosis of inguinal hernias in infants can often be made from the history alone. Seldom is the physician afforded an opportunity to visualize or palpate the bulging hernia in infants. He must rely on the history and on palpating the thickened processus vaginalis just below the external ring. Repair of inguinal hernia in infants and children as soon as the diagnosis is made is a safe, permanent, yet

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The place of publication of the periodicals appears in brackets preceding each abstract.

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simple solution to a serious problem. The author lists the following reasons for advising early repair of infantile inguinal hernias: 1. Inguinal hernias seldom disappear spontaneously. 2. Incarceration in patients under one year of age is more frequent than in those at any other age. 3. An ovary may become incarcerated and become gangrenous. 4. A testicle may become gangrenous from pressure of an incarcerated hernia. 5. Parents are worried until the hernia is repaired. 6. Mortality and morbidity are lower when the operation is performed as an elective procedure. 7. The use of a truss is obsolete and often ineffective in preventing incarceration.

The frequent finding of sliding hernias in infants has not received proper emphasis. Sliding hernias often have the cecum, bladder, or fallopian tube as an integral part of the wall of the sac. In such instances the sac cannot be ligated as high as is desirable, but it is not necessary to open the abdomen through a separate incision as is advocated sometimes for similar hernias in adults. Sliding hernias in infants can be repaired by adhering to the following principles: (1) avoid cutting into the bladder, fallopian tube or cecum; (2) ligate the sac just distal to the involved viscus; and (3) if the ligated sac fails to retract inside the internal ring, suture it under the conjoined muscle. Recent advances in anesthesia and pediatric surgical technique have not only shortened the hospital stay (two days in most instances) but have also lowered the morbidity and mortality.

Incarcerated Appendices Epiploicae. S. S. Fieber. J. M. Soc. New Jersey **53:**87 (Feb.) 1956 [Trenton, N. J.].

A nonreducible bulge developed in a 44-year-old man who had a history of a left inguinal bulge of 13 years' duration that had always been reducible. A left inguinal incision was made. A 5-cm., blue, oval mass protruded through a 3-cm. defect in the floor of the inguinal canal at a point midway between the internal inguinal ring and the pubic tubercle. The sac contained two dark red-blue fatty structures attached to the sigmoid colon. These appendages were resected at the base of their attachment to the colon. The floor of the inguinal canal was reconstructed by approximating transversalis fascia to the shelving border of Poupart's ligament. The microscopic picture of the appendices epiploicae demonstrated extravasated blood with a few thrombosed blood vessels, consistent with a diagnosis of early infarction. Only 29 such cases have been reported. The appendices epiploicae of the sigmoid colon, because of their mobility, have a propensity for finding their way into hernial sacs on the left side. Inguinal hernias are more frequently involved in males and femoral hernias in females.

NEUROLOGY & PSYCHIATRY

Experiences with Hypophysectomy in Patients with Cancer of the Breast and in Diabetic Patients with Kimmelstiel-Wilson Syndrome. R. Luft and H. Olivecrona. Schweiz. med. Wchnschr. **86:**113-117 (Feb. 4) 1956 (In German) [Basel, Switzerland].

Hypophysectomy was performed at the Serafimer Hospital in Stockholm, Sweden, on 50 patients with carcinoma of the breast and on 19 patients with diabetes mellitus associated with vascular changes in the eyes and in the kidneys. The surgical procedure consisted of exposure of the chiasm, retraction of the right optic nerve to the right side, clamping and sectioning of the infundibulum, widening of the aperture of the infundibulum in the hypophysis with the aid of blunt instruments, and removal of the contents of the sella turcica with a curet. When gland material could no longer be obtained by curettage, remnants of the gland were removed with the aid of a rotating felt ball followed by cauterization of the sella two to three times with sodium hydroxide solution and with Zenker's solution. Sodium hydroxide solution has been used because its remote effect is greater than that of the acid fixative. It remains to be seen whether this procedure presents a solution for the technical problem of complete hypophysectomy.

There were three operative deaths among the 50 patients with carcinoma of the breast. Three patients died from intercurrent disease within several weeks to nine months after the operation. Twenty-four patients died of carcinoma within several months to two years after the operation and did not show any improvement, except for disappearance or partial relief of pain. Subjective and objective improvement resulted from the hypophysectomy in 20 patients with carcinoma of the breast. Objective improvement consisted of healing or of reduction in the size of the carcinomatous ulcers, disappearance or definite improvement of the cutaneous or lymph node infiltration, and reduction or cessation of development of pulmonary and bone metastases for at least six months. The patients showed an increase in body weight, had no pain, and were able to resume their work. Improvement usually lasted for from one to two years. Seven patients with remissions died after two years. At the time of writing, 11 patients were still alive one to three and one-half years after the hypophysectomy. Three patients with carcinoma of the breast who had undergone adrenalectomy and were later subjected to hypophysectomy died within several weeks of advancing carcinoma. On discharge from the hospital, the surviving patients were given substitution therapy with maintenance doses of 25 mg. of cortisone and 100 mcg. of thyroxin.

Of the 19 patients with diabetes mellitus who were subjected to hypophysectomy, 3 died of postoperative complications within from one day to four weeks after the operation, a mortality rate of 15%. Four patients died later of hypoglycemia, progressive arteriosclerosis, hypertensive crisis, and uremia. Twelve patients survived and were followed up for from three months to four years. In addition to 10 to 15 mg. of cortisone, these patients were given 100 to 150 mcg. of thyroxin, and the men received testosterone, while the women were given estrogens. The insulin requirement dropped after the operation to one-third or one-quarter of the preoperative dose, and 8 to 24 units were usually sufficient. Epileptic attacks, which were never observed among the patients with carcinoma of the breast, occurred in the diabetic patients, usually at the end of the first postoperative week, and subsided at the end of the second week. They were caused by swelling of the brain, a normal occurrence in intracranial surgery. A drop in systolic and diastolic pressures was observed in the surviving patients in the course of the first postoperative year. In two patients who were followed up for 25 and 43 months, respectively, the blood pressure had again reached its preoperative level. A pronounced reduction in the size of the heart was observed in nine patients. Renal blood perfusion was not changed after the operation, but glomerular filtration was reduced as compared with the preoperative condition; the latter phenomenon was interpreted as a sign of reduced tonicity of the glomerular capillaries. It may exert a favorable influence on the renal circulation. Circulatory and renal lesions did not show any changes after the hypophysectomy. All of the patients had advanced retinopathy before the operation; this became worse after the operation in only one patient, after an acute attack of chronic polyarthritis. In the rest of the patients, the retinopathy seemed to have come to a standstill, and visual acuity and retinal findings were improved in several patients.

Spinal Cord Involvement Due to Cervical Spondylosis. L. H. Segerberg. Am. Surgeon **22:**227-235 (Feb.) 1956 [Baltimore].

The occurrence of spinal cord involvement resulting from cervical spondylosis is reported in eight patients between the ages of 45 and 68 years. There was a common history of variable duration of difficulty in ambulation, described by some patients as stiffness and unsteadiness of the lower extremities, while other patients complained of fatigability and aching of the legs similar to intermittent claudication. Difficulty in motor function of the upper extremities was noted by most patients as consisting primarily of a loss of dexterity. Complaints of sensory abnormalities in the lower extremities were not common, but all the patients except one complained of some sensory abnormality in the upper extremities. Neck pain was a fairly universal symptom. Many of the patients also complained of headache, which probably was caused by tension and spasticity of the cervical muscles. The symptoms were progressive in all patients. All patients showed signs of pyramidal tract involvement. Myelography was carried out in all patients. Six to 9 cc. of iophendylate injection (Pantopaque) was introduced into the lumbar sac and carried up into the cervical region. Some of the anteroposterior myelograms showed a complete separation of the column at the level of the midline bars that developed at the intervertebral level, but the lateral pictures of the pantopaque column proved to be of greatest

importance by showing the anterior ribbing most clearly and at multiple levels. In only one patient was a single midline bar found; three patients had two levels involved, three had three bars present, and in one patient four bars were found. Significant also was the presence of a posterior indentation in many myelograms. Conservative measures have no place in the treatment of patients with neurological deficit from cervical spondylosis. The patients were subjected to a cervical laminectomy with the aid of endotracheal anesthesia. The laminas overlying the demonstrated cervical bars were removed, the dura was opened in the midline, and a bilateral section of the dentate ligaments was done. Results were uniformly good. No patient recovered completely normal neurological function, but marked improvement occurred in every one and the progression of symptoms was halted.

The suspicion of cervical spondylosis with spinal cord involvement must be entertained in a patient over 45 years of age with a history of a progressive nonremitting neurological disability, consisting primarily of difficulty with gait and clumsiness of the upper extremities with some sensory disturbance in the hands, who shows signs of bilateral pyramidal tract involvement. Cervical spondylosis is not necessarily confined to one segmental level. Several bars may be the agents responsible for the cord symptoms and signs. Demonstration of the number and levels of the bars is best done by means of the lateral myelogram. A direct surgical attack on the bars themselves is extremely hazardous because of the distinct possibility of further disabling the patient. Cervical laminectomy and section of the dentate ligaments has proved effective when extensively carried out.

GYNECOLOGY & OBSTETRICS

Bilateral Simultaneous Tubal Pregnancy: Review of Literature and Report of Case. M. T. Hoerner. Am. J. Surg. **91**:385-388 (March) 1956 [New York].

A case of bilateral simultaneous tubal pregnancy is described in a 33-year-old woman who had been married 12 years, had had no pregnancies, and had had her last menstrual period in November, 1952. She did not menstruate in December, 1952. On January 2, 1953, the patient began what she thought was her next period, but after 24 hours the heavy flow stopped, and daily thereafter she continued to have spotting. On January 6, 1953, sudden severe pain developed in the lower abdomen. Pelvic examination revealed the cervix to be softer than normal and the uterus to be slightly enlarged. There was an extremely tender, fixed mass about 8 cm. in diameter in the left adnexa. There was thickening and tenderness in the region of the right fallopian tube, but no mass was palpated. The mass in the left adnexa extended downward toward the cul-de-sac, which was also extremely tender. A diagnosis of ruptured left ectopic tubal pregnancy was made and confirmed on laparotomy. The left fallopian tube was resected. The left ovary was normal and was therefore not disturbed. The uterus was enlarged to the size of a six-week pregnancy. The right fallopian tube was found to be enlarged throughout, with a knob-like swelling 2.5 cm. in diameter in its distal third. The sealed fimbriated end of the tube was opened, and a large amount of bright red blood and of old dark blood exuded from the end of the tube. This blood washed out a mass of yellowish gray, sponge-like material, suggesting the presence of placental tissue. Excessive bright red bleeding from the fimbriated end of the tube could not be controlled, and a salpingectomy was performed. The right ovary contained a corpus luteum but was otherwise normal. Microscopic examination of both removed fallopian tubes showed decidua and chorionic villi. They were apparently in the same stage of development. Fluffy masses composed of chorionic villi were also present.

Bilateral simultaneous tubal pregnancy is a rare condition. When this case is added to those collected from the literature, there is a total of 110 cases reported through the year 1954. The discovery of bilateral ectopic pregnancy in this case emphasizes the importance of investigating the condition of the tube that has not been involved by ectopic pregnancy. There is justification for being conservative and performing a plastic operation on the remaining tube in women in early married life who have no children, since numerous pregnancies with subsequent delivery of normal children have been achieved after these plastic procedures.

Endometriosis of the Colon. J. F. Reynolds. J. Maine M. A. **47**:41-42 (Feb.) 1956 [Portland, Maine].

A 47-year-old woman complained of attacks of indigestion with pain in the left side and of diarrhea with bloody stools alternating with constipation. Four years before she had been seen by a physician who advised her, after sigmoidoscopy, that she had ulcerative colitis. Her intestinal symptoms had not been too bothersome recently. She had four or five bowel movements daily, with some mucous and blood, and progression of her constipation during the weeks previous to her hospitalization. Her menstrual history was interesting in that she had had two or three periods of amenorrhea during the previous two years and had had some hot flushes. She had taken estrogens intermittently.

The results of physical examinations and laboratory tests were largely normal, but a barium enema disclosed a 2-cm. to 3-cm. area of stenosis, with apparent shelf formation proximally and distally that was highly suggestive of malignancy of the sigmoid colon. A tentative diagnosis of a malignancy of the sigmoid colon was made and a laparotomy advised. At exploration, the sigmoid was found to be adherent to the left tube and ovary, which contained large chocolate cysts. The other tube and ovary were essentially normal. There were no palpable mesenteric lymph nodes and no other evidence of intra-abdominal disease. Bilateral salpingo-oophorectomy and ample resection of the involved portion of the sigmoid with end-to-end anastomosis were completed. The patient's postoperative course was uneventful, and she was discharged from the hospital on the ninth postoperative day and has remained well. Pathological evaluation of tissues revealed endometriosis of the ovaries with active endometrial glands surrounded by well-formed endometrial stroma and edematous epithelial tissues in the resected specimen of the sigmoid colon. The diagnosis of endometriosis of the colon is seldom made prior to surgery. Even at the operating table the differentiation between carcinoma and endometriosis of the colon may be difficult.

PEDIATRICS

Subdural Effusions in Infancy. E. E. Herzberger, Y. Rotem and J. Braham. Harefuah **50**:59-61 (Feb. 1) 1956 (In Hebrew, with English and French summaries) [Jerusalem–Tel Aviv, Israel].

Thirty-three cases of subdural effusion in infants between the ages of 1 day to 20 months are reported on. Since the initial subdural tap gave positive results in 32 of these infants, the effusions could not have been secondary to the procedure. While the subdural effusion was caused by trauma in four infants and by preceding suppurative meningitis in another 15, no primary intracranial disease was observed in 12 infants who had symptoms of systemic intestinal or pulmonary infection or malnutrition before the diagnostic tap was done. The unexpected finding of a large subdural effusion at autopsy in one patient with this clinical aspect led to exploration with positive results in many similar cases. Reduction of cerebral volume caused by dehydration, intracranial venous thrombosis, and increased capillary permeability are discussed as likely pathogenic mechanisms.

Repeated taps (not more than four) were sufficient to bring about resolution in seven infants. Burr holes were made in 22 patients in whom the effusion persisted, and because of rapid recovery no further treatment was practiced except in two infants in whom thick membranes were found; only these two patients were subjected to craniotomy. The burr holes allowed inspection of the intracranial contents for the presence of membrane and brain damage. It was possible in this way to conclude that prognosis and the severity of the clinical state were closely related to the degree of visible brain damage and only to a much lesser extent to the presence of a membrane. The authors recommend a conservative neurosurgical attitude. This would seem compatible with the immediate results obtained in these infants, but a prolonged follow-up for years, and particularly during the patients' school years, will be required before final assessment is possible.

BOOK REVIEWS

The Management of Pain in Cancer. Edited by M. J. Schiffrin, Ph.D., Assistant Professor of Anesthesiology, University of Illinois College of Medicine, Chicago; Assistant Director of Clinical Research, Hoffmann LaRoche, Inc., Chicago. Cloth. $3.50. Pp. 244, with 10 illustrations. Year Book Publishers, Chicago, 1956.

This monograph has eight contributors who, with the editor, have prepared seven chapters. Each chapter deals with a different approach to therapy. The analgesics are discussed in the first chapter, which lists those in common use with a brief pharmacological discussion and mention of their undesirable effects. There follows a chapter on nerve blocks, with illustrations and brief descriptions of techniques and indications. Neurosurgical management with nerve section, chordotomy, leukotomy, and palliative operations is described briefly with indications. A further chapter concerns general surgery. Humoral and chemical palliation and radiation therapy are the subjects of other special chapters. The volume is completed with a discussion of the psychological aspects of the subject. The editor states "The aim of the book is to guide the family physician." It has succeeded in its purpose, in that it is a guide to this complex problem. It will not interest the specialist or those preparing for practice in the specialties. The book has a table of contents and an index but no bibliography. It is pocket book size. The illustrations are not very illuminating.

Local Analgesia: Head and Neck. By Sir Robert Macintosh, D.M., F.R.C.S., F.F.A.R.C.S., Nuffield Professor of Anaesthetics, University of Oxford, and Mary Ostlere, M.B., M.R.C.P.E., F.F.A.R.C.S., Research Assistant, Nuffield Department of Anaesthetics, University of Oxford, Oxford, England. Cloth. $6.50. Pp. 138, with 145 illustrations by Marjorie Beck. E. & S. Livingstone, Ltd., 16 and 17 Teviot Pl., Edinburgh 1, Scotland; Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore 2, 1955.

The purpose of this monograph is to describe techniques that the authors have found to be useful in providing analgesia for operations on the head and neck. In this respect it is a useful manual. The first half of the book covers the anatomy of the cranial nerves, the cervical plexus, and the autonomic nerve supply to the head and neck. There are chapters on the anatomy of the orbit and eye, nasal cavity, mouth, and tonsils. The illustrative and minimal but essential descriptions are excellent. Color is used to advantage to emphasize the salient points. The second part of the book discusses techniques. Reliance here is again placed on illustrations with only the essential descriptions and directions. The monograph is well prepared so far as ease of reading is concerned, with an excellent choice of type, printing, and arrangment of material. It should interest and be useful to surgeons who deal with head and neck problems and to anesthesiologists as well as students in these special fields. There is an index and an inadequate bibliography following some of the chapters.

A Modern Pilgrim's Progress for Diabetics. By Garfield G. Duncan, M.D., Clinical Professor of Medicine, Jefferson Medical College, Philadelphia. Cloth. $2.50. Pp. 222, with illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; W. B. Saunders Company, Ltd., 7 Grape St., Shaftesbury Ave., London, W.C.2, England, 1956.

This is a new primer for diabetic patients and their families written by a physician with wide experience. Like other primers it contains most of the information that diabetics should have but differs from all others in the fact that its story is written in narrative form. The heroine, Peggy MacDonald, is a diabetic. In her position as social worker in a large hospital containing a clinic for diabetics her contacts and experience with the diabetic patients and their physicians are the basis for a simple but informative story. The usual practical reference sections, concerning diet, testing, and insulin-administering, are appended.

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

The Back and Its Disk Syndromes Including Injuries, Diseases, Deformities and Disabilities: With Notes on the Pelvis and Coccyx. By Philip Lewin, M.D., F.A.C.S., F.I.C.S., Professor of Orthopædic Surgery, Cook County Graduate School of Medicine, Chicago. Second edition. Cloth. $18.50. Pp. 942, with 375 illustrations [including] line drawings by Harold Laufman, M.D., Associate Professor in Surgery, Northwestern University Medical School, Chicago. Lea & Febiger, 600 Washington Sq., Philadelphia 6, 1955.

Practically everything that has been said or done about the back is included in Dr. Lewin's book. The material has been gleaned from years of careful scrutiny of the literature plus extensive clinical experience. This makes for a comprehensive storehouse of information that is useful for reference. Specialists in various fields of medicine should find helpful material in the book. On the other hand, the general practitioner will have difficulty finding ready solutions to his problems because of the complex presentation. It is doubtful that readers will agree with the idealistic statement that "all back injuries, except those involving fracture, dislocation or pre-existing bone change, can be cured promptly and easily by early, efficient treatment." The book has a large bibliography that could have been more valuable if the references had been annotated in the text.

Pathologic Physiology: Mechanisms of Disease. Edited by William A. Sodeman, M.D., F.A.C.P., Professor of Medicine and Chairman of Department of Medicine, School of Medicine, University of Missouri, Columbia. Second edition. Cloth. $13. Pp. 963, with 173 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, England, 1956.

This book deals with the functional or physiological, as distinguished from the structural or anatomic, aspects of human disease. The first edition appeared in 1950; for the second there have been extensive revisions and additions, especially a chapter on abnormal growth and one on the nervous system. The book is still incomplete. Part 9 on the locomotor system, for instance, consists of a single chapter on the joints. The numerous and undeniably important dysfunctions of the reproductive system must be looked for in the chapter on endocrine glands. The term "referred pain" does not appear in the index, and information about it must be sought here and there in the text. There is, however, a wealth of concrete information about cardiac and gastrointestinal physiology, and some subjects are treated in greater detail than will seem necessary to the occasional hurried reader. This unevenness is presumably related to the multiple authorship, and can be corrected in future editions.

Christopher's Textbook of Surgery. Edited by Loyal Davis, M.D., Chairman of Department of Surgery, Northwestern University Medical School, Chicago. Sixth edition. Cloth. $15.50. Pp. 1484, with 1359 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; W. B. Saunders Company, Ltd., 7 Grape St., Shaftesbury Ave., London, W.C.2, England, 1956.

The first edition of this textbook appeared in 1936. In the past 20 years it has undergone five revisions and has justifiably gained top ranking. The editor has surrounded himself with 86 distinguished contributors in preparing the new edition. Advancements in the principles of surgery, the extension of the bounds of surgical procedures, and the contributions of the basic sciences to surgical therapy have been outstanding in recent years. For these reasons authors were chosen who could best present these advances as they apply to surgery, both general and regional. Each author substantiates his statements by a selected authoritative bibliography. A unique feature is a background sketch that appears beneath the name of each contributor. The opening chapter is an excellent review of the history of surgery. This section also includes a discussion on the training of the surgeon. The final chapter deals with the qualifications of a surgeon. Ethical conduct and attitudes on fee splitting and other matters are clearly presented in terms that the student and the surgeon will comprehend. The editor has correlated the specialties of surgery unusually well. The illustrations, some of which are line drawings, are well placed, authoritative, and clear. Dr. Davis has succeeded in maintaining the high standard of the preceding editions.

QUERIES AND MINOR NOTES

SUDDEN DEATH DURING CORONARY ATTACK

To the Editor:—*A 50-year-old man, suffering from his first coronary occlusion, came to me 48 hours after pain had begun. The pain had been more severe for the six hours before the visit. Physical findings were negative except for mild shock. The electrocardiogram revealed a right intraventricular heart block, with an acute anteroseptal myocardial infarction and with premature ventricular contractions. In one hour after four morphine injections, the pain was relieved almost completely. The blood pressure returned to normal, and two hours after entering the office he was apparently free of pain, mentally alert, and not unduly apprehensive. His pulse was 100 beats per minute. He was removed from the examining table to the ambulance litter by three attendants, and all known precautions and care were used. He immediately died. Electrocardiogram showed ventricular fibrillation that did not respond to quinidine, procainamide, or epinephrine intravenously. Did the change from the relatively warm environment to the relatively colder ambulance stretcher precipitate the fatal arrhythmia? When is it safe to move a patient with an acute coronary attack either from the office or from the home to the hospital? Are there any other office therapeutic measures that could have been instituted with any reasonable amount of success?*

M.D., Tennessee.

Answer.—Ventricular fibrillation is a not uncommon terminal event in the course of acute myocardial infarction, when this arrhythmia may appear abruptly without other recognizable precipitating causes. In patients having premature ventricular beats immediately after a coronary thrombosis, quinidine or procainamide have been suggested as prophylactic agents. These drugs may occasionally prevent fatal arrhythmias, but their routine use has not been proved effective for this purpose. Both drugs are contraindicated in the presence of atrioventricular block with episodes of ventricular tachycardia or fibrillation. It is impossible to say whether moving the patient precipitated ventricular fibrillation. Certainly, most such patients, unless they are in profound shock or severe congestive failure, can be safely moved from the office or home to the hospital if a narcotic is first given to control pain and apprehension. Rough handling and exposure to cold should of course be avoided, and a medical attendant and oxygen should be available during the journey by ambulance. No drug has proved of value in the treatment of ventricular fibrillation. This ordinarily involves direct application of electrodes to the exposed heart, artificial respiration, and cardiac massage, although defibrillation with externally placed electrodes has been described. It cannot be considered an office procedure. Furthermore, electric defibrillation is not usually successful in restoring normal rhythm in cases of fresh myocardial infarction.

CADMIUM TOXICITY

To the Editor:—*What are the hazards of exposure to cadmium dust? I will appreciate references.*

Maxwell J. Antell, M.D., Bridgeport, Conn.

Answer.—Cadmium and many of its compounds produce toxic effects. Cadmium may enter the body along with food after contamination by cadmium-plated cooking utensils. Some states prohibit the use of cadmium-plated articles in the preparation of food or beverages. In industrial pursuits, cadmium exposure is likely to be associated with the inhalation of cadmium dust or fumes, the latter chiefly in connection with metal cutting or welding. The oral intake of cadmium leads to a violent, acute state characterized by salivation, vomiting, abdominal pain and diarrhea, all related to an ulcerated gastroenteritis. Inhalation of cadmium leads in its mildest form to throat dryness, coughing, a sense of chest tightness, and occasionally nausea and vomiting. More severe damage is marked by pneumonitis accompanied by severe chest pain, dyspnea, and prostration. The maximum tolerable concentration of cadmium is 1 mg. per 10 cubic meters of air.

References

Patty, F. A.: Industrial Hygiene and Toxicology, New York Interscience Publishers, Inc., 1949, vol. 2.

Hunter, D.: The Diseases of Occupations, Boston, Little, Brown & Company, 1955.

Friberg, L.: Proteinuria and Kidney Injury Among Workmen Exposed to Cadmium and Nickel Dust: Preliminary Report, J. Indust. Hyg. & Toxicol. **30**: 32 (Jan.) 1948.

THIRD INJECTION OF SALK VACCINE

To the Editor:—*The recommended schedule for the third or booster injection of Salk poliomyelitis vaccine is not less than seven months after the second. A local physician is giving the third injection one month after the second. What advantage or disadvantage is there in giving the injection this way?*

M.D.

Answer.—The disadvantage is that the full booster effect is not achieved by a one-month interval. It appears that two doses, one week apart, are little better than a single dose. Those who received three doses in five weeks, which is the schedule used in the field trial, should be given a booster at approximately seven months after the last dose, to fulfill the schedule for booster that had been recommended. (See letter to the Editor in this issue, page 392, and also the editorial in The Journal, Nov. 26, 1955, page 1303.)

PERIODIC ULCERATIONS OF LABIA

To the Editor:—*In January, 1955, a 30-year-old white married mother of four children had a light vaginal discharge and since then has complained of numerous, small, superficial, painful, itchy ulcerations of the outer surface of the labia minora and the inner surface of the labia majora. If untreated, these ulcerations disappear entirely during her regular painless five-day menstrual period. A few days after the period the ulcerations occur and last until the next period. From time to time she has also complained of slight perianal itching but has never had any ulceration in this area. The discharge in January was treated as moniliasis and has not recurred. These ulcerations can be fairly easily controlled by a sodium and zinc caprylate dusting powder. Please suggest a curative program.* *R. B. Hess, M.D., Terre Hill, Pa.*

Answer.—The etiology may perhaps be determined by making cultures of the ulcerated areas at the time they are present. The disappearance of the lesions with the onset of menstruation may indicate a relationship to premenstrual tension. The etiology of premenstrual tension has been stated to be an increased amount of estrogen in the blood before the onset of menstruation or an insufficient amount of progesterone secretion at this time. Frank (Hormonal Causes of Premenstrual Tension, *Arch. Neurol. & Psychiat.* **26**:1053 [Nov.] 1931) advocated magnesium sulfate orally for the treatment of premenstrual tension on the theory that it would hasten excretion of the excess estrogen by the intestine. Israel (Premenstrual Tension, *J. A. M. A.* **110**:1721 [May 21] 1938) reported excellent results with progesterone therapy. Greenhill and Freed (Mechanism and Treatment of Premenstrual Distress with Ammonium Chloride, *Endocrinology* **26**:529 [March] 1940) have obtained excellent results with ammonium chloride orally. Patients with premenstrual tension are advised to refrain from adding table salt to their food during the last two weeks of the menstrual cycle. During this time they are given 0.6 gm. of ammonium

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chloride three times daily. A large number of women have been treated with this simple remedy, and nearly all of them have been relieved of premenstrual distress. Another simple and effective agent is testosterone propionate. The patient may be given 25 mg. hypodermically on the 10th and 3rd day before the expected menstruation, or, better still, she can take a 10 mg. tablet of methyltestosterone or a 5 mg. tablet sublingually or buccally daily for 10 days before the expected onset of menstrual flow (Freed: Treatment of Premenstrual Distress with Special Consideration of Androgens, *J. A. M. A.* **127**:377 [Feb. 17] 1945).

BIOLOGICAL FALSE-POSITIVE REACTION

To the Editor:—*A 40-year-old slightly obese woman had the following serologic tests in 1954, the results of which were: Kline, 4+; Mazzini, 3+; Mazzini cardiolipin, 4+; and Venereal Disease Research Laboratory, 3+. Quantitative dilutions used were: 0.1 cc. (negative), 0.05 cc., 0.025 cc., 0.012 cc. (negative), and 0.006 cc. (negative). Repeated tests for the past year have been positive to date. The Treponema pallidum immobilization test at Ann Arbor, Mich., was reported negative for spirochetal disease in October, 1955. Physical examination and spinal fluid were negative. Routine Wassermann test six years ago was negative. A normal child was delivered six years ago by cesarean section. Results of the Kline test given to the patient's husband in October, 1955, were negative. No history of lesions, contact, or known illnesses of any type in the past 10 years, except for a common cold, was reported. Only medication given was Dexedrine for obesity. The question is whether to treat the patient despite a negative Treponema pallidum immobilization history and physical examination. May the positive serologic findings be indicative of early collagen disease, and, if so, how can it be ruled out?* *M.D., Wisconsin.*

Answer.—In this case it is noted that the precipitation tests were positive and a Treponema pallidum immobilization test was negative for syphilis. The quantitative dilutions indicate a low titer of reagin. This is what one would expect in a biological false-positive reaction. With a negative history and physical examination, there is no indication for antisyphilitic therapy. Many diseases, such as upper respiratory infections, infectious mononucleosis, hyperproteinemia, chickenpox, infectious hepatitis, malaria, tuberculosis, scarlet fever, lupus erythematosus, and various so-called collagen diseases, and vaccination against smallpox may induce pseudosyphilitic positivity. No tests are known that would reveal the exact factor in any individual case.

REMOVAL OF NEVUS

To the Editor:—*A 29-year-old healthy white man has a light brown pigmented mole, or nevus, 4 mm. in diameter, 2 cm. above the sole of his left foot on the lateral aspect of the foot directly below the malleolus. The nevus is quite flat and can hardly be felt. It causes no symptoms, and there has never been any change in appearance noted. Shoes, of course, cover this area but cause no extraordinary irritation. This person has several other pigmented nevi on other parts of his body. His complexion is dark, he has dark hair, and he is of Irish-English-German descent. Should this nevus be removed? And, if so, by what method? Do darkly pigmented individuals run less risk of their nevi becoming malignant than do blond individuals?*

Arthur M. Clark, M.D., Dearborn, Mich.

Answer.—Since the nevus has not changed in size or color and does not have an inflammatory halo or cause any subjective symptoms, removal is not imperative; however, the lesion should be observed from time to time for any such changes. On the other hand, there is a rather general feeling that nevi on the feet and genitalia are better removed. If it is decided to remove the nevus, a 6 mm. skin punch would adequately remove it along with a border of normal tissue; it should be examined microscopically to determine whether or not any junctional activity is present. Darkly pigmented individuals are not necessarily more subject to malignant degeneration of nevi than are lighter-skinned persons.

PAINS IN PREGNANT WOMAN'S ARMS

To the Editor:—*What is the mechanism and management of pains in the arms affecting many pregnant women, especially at night?* *J. Roy Guyther, M.D., Mechanicsville, Md.*

Answer.—Pains in the arms are not common in pregnant women, but they may have the same origin as pains in the legs, which do occur frequently during gestation. Cramps or muscular contractions in the legs, especially during the night, occur in about half of pregnant women between the 24th and 34th week of pregnancy. Page and Page believe that large quantities of milk or dibasic calcium phosphate predispose to muscular tetany. The consumption of milk causes a fall in diffusible calcium and a rise in inorganic phosphorus concentration of the blood. Shifts of the acid-base balance toward the alkaline side may be contributory. Leg cramps may be prevented or relieved to a significant degree by (1) reducing the intake of milk, (2) using calcium salts free from phosphorus, or (3) adding small quantities of aluminum hydroxide gel to the diet, in order to remove some of the dietary phosphorus from the intestinal tract. The reduction of milk and the addition of aluminum hydroxide gel to the diet relieves leg cramps by causing a rise in the ionizable calcium concentration of the blood. In some women, leg cramps can be relieved by the daily administration of 5 to 10 mg. of thiamine hydrochloride. During an attack, massage helps, as does standing on a cold floor. (Greenhill, J. P.: Obstetrics, ed. 11, Philadelphia, W. B. Saunders Company, 1955.)

TONSILLECTOMY

To the Editor:—*If a pediatrician saw 1,000 different children in a year, what percentage of them would need a tonsillectomy and adenoidectomy?*

G. R. Marshall, M.D., Effingham, Ill.

Answer.—An answer to such a question is difficult because of the various factors that might influence the reply. Climate and season might affect percentages in different localities. There is not always unanimity of opinion as to whether a tonsillectomy and adenoidectomy should be performed. In an area where streptococcic infections are frequently encountered, the percentage of sore throats and otitis media among children might be unusually common. Under the latter conditions the indications for tonsillectomies might be numerous. The actual number of tonsillectomies and adenoidectomies has undoubtedly declined in recent years. Because it has been contended that these operations enhance the possibility of acquiring poliomyelitis when performed during epidemic periods, most hospitals prohibit such operations during the summer. Formerly this was the season of the year when the majority of such operations were performed.

HOSPITAL RECORDS

To the Editor:—*As director of the Student Health Center at Ohio University, I have charge of a 40-bed student hospital. Frequently I am confronted with the question of records. How long is a hospital supposed to keep records of patients who were admitted? Is there a legal time? Is the time determined by the hospital association, or is there no standard time that one should keep records?*

Eleanora L. Schmidt, M.D., Athens, Ohio.

Answer.—Decisions regarding preservation of medical records are dependent on a number of factors, including the storage space available and the likelihood of these records being of future service to the patient, the physician, or the hospital. Preservation is generally thought desirable until such time as the statute of limitations for professional liability actions provides has run, and in the case of students it should be noted that this does not usually commence to run until the student has reached his or her majority. Local legal counsel should be consulted regarding statutory requirements. The American Hospital Association in September, 1947, adopted a resolution in which it recommended that in general hospitals records need not be kept more than 25 years.